

PATENT ABSTRACTS OF JAPAN

(11)Publication number : **10-286972**

(43)Date of publication of application : **27.10.1998**

(51)Int.Cl.

B41J 2/175

(21)Application number : **09-111457**

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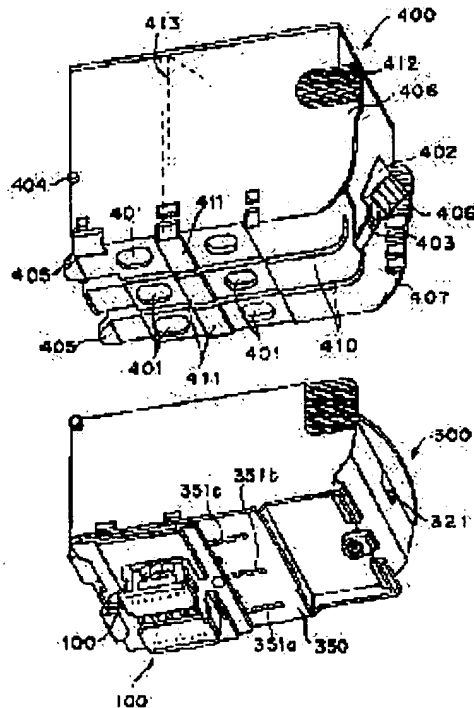
(22)Date of filing : **28.04.1997**

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(30)Priority

Priority number : 08229518	Priority date : 30.08.1996	Priority country : JP
08230449	30.08.1996	JP
09 29492	14.02.1997	JP
09 30377	14.02.1997	JP

(54) INK TANK, HOLDER, INK JET CARTRIDGE AND CAP



(57)Abstract:

PROBLEM TO BE SOLVED: To prevent mixing of ink colors due to leakage of ink from a supplying hole which may occur when an ink tank for housing multiple kinds of inks in respective housing chambers is loaded or unloaded to or from a device.

SOLUTION: Grooves 410 each having a predetermined depth are provided between each adjacent ink supplying holes 401 for inks of yellow (Y), magenta (M) and cyan (C) in an ink tank 400 so that the supplying holes 401 are separated by the grooves 410. As a result, it is possible to prevent mixing of inks having different colors even when the ink leaks from one of the ink supplying holes 401.

LEGAL STATUS

[Date of request for examination] 09.06.2000

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number] 3295339

[Date of registration] 05.04.2002

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] It is the ink tank characterized by being able to detach and attach freely to the electrode holder equipped with the ink jet head, and being the ink tank which has a latch lever in the path-of-insertion anterior part to this electrode holder at the engagement section and said path-of-insertion posterior part, and for said ink tank having two or more ink feed hoppers in the field contiguous to the part which has said engagement section and said latch lever, respectively, and preparing the slot parallel to said path of insertion at least between lots among these two or more ink feed hoppers.

[Claim 2] The ink tank according to claim 1 characterized by preparing two or more ink feed hoppers which supply the ink of an affiliated color in the field divided by two of said slots.

[Claim 3] The ink tank according to claim 2 characterized by preparing the ink feed hopper which supplies ink with more high concentration among the ink feed hoppers of said affiliated color in said engagement section side.

[Claim 4] Said slot is an ink tank according to claim 1 to 3 characterized by compressing the ink absorber which is formed so that the flute width concerned may become narrow in the depth direction, and is contained inside the ink tank concerned according to this flute width.

[Claim 5] The ink tank according to claim 1 to 4 characterized by having further the protection wall which can contain this latch lever with the variation rate of said latch lever.

[Claim 6] It is the electrode holder which is equipped with an ink jet head and holds an ink tank free [attachment and detachment]. Said ink tank It is the ink tank which has a latch lever in the path-of-insertion anterior part to an electrode holder at the engagement section and said path-of-insertion posterior part. Said ink tank is an electrode holder characterized by having two or more ink feed hoppers in the field contiguous to the part which has said engagement section and said latch lever, and establishing the slot parallel to said path of insertion in it at least between lots among these two or more ink feed hoppers, respectively.

[Claim 7] Said electrode holder is an electrode holder according to claim 6 which a guide member is prepared in the side-face inside, guides the projection of the side face of said ink tank along with this guide member, and is characterized by rotating the ink tank concerned and equipping an electrode holder by using said engagement section as the supporting point.

[Claim 8] The electrode holder according to claim 7 with which distance between the joint which connects said ink tank and ink jet head in said electrode holder, and said supporting point at the time of ink tank wearing is characterized by being below one half of the distance of the point for wearing laborious works, and the supporting point.

[Claim 9] The electrode holder according to claim 7 or 8 characterized by preparing the elastic member a part of whose cross-section configuration of the junction direction is a trumpet

configuration in said joint.

[Claim 10] 9 is [claim 7 characterized by preparing the passage formation member which forms ink passage in the pars basilaris ossis occipitalis of said electrode holder thru/or] the electrode holder of a publication either.

[Claim 11] The electrode holder according to claim 10 characterized by forming said a part of passage formation member by the transparence member.

[Claim 12] Said guide member prepared inside said electrode holder is an electrode holder according to claim 7 to 11 characterized by consisting of upper limbs of said electrode holder with the guide rail which was formed in the other end of the inclination guide-rail section which inclined downward, the level guide-rail section prolonged almost horizontally from the lower limit of the inclination guide-rail section, and the level guide-rail section, and which becomes depressed and has the section.

[Claim 13] It is the ink tank which can detach and attach freely to the electrode holder equipped with the ink jet head, and has a latch lever in the path-of-insertion anterior part to this electrode holder at the engagement section and said path-of-insertion posterior part. The ink tank by which it has two or more ink feed hoppers in the field contiguous to the part which has said engagement section and said latch lever, respectively, and the slot parallel to said path of insertion is established in it at least between lots among these two or more ink feed hoppers, The ink jet cartridge characterized by having the electrode holder equipped with said ink jet head.

[Claim 14] The cap characterized by to be able to detach and attach freely to the electrode holder equipped with the ink-jet head, to be the ink tank which has a latch lever in the path-of-insertion anterior part to this electrode holder at the engagement section and said path-of-insertion posterior part, to have two or more ink feed hoppers in the field contiguous to the part which has said engagement section and said latch lever, respectively, and to be attached at least between lots among two or more of these ink feed hoppers free [attachment and detachment on the ink tank by which the slot parallel to said path of insertion is prepared].

[Claim 15] Said cap is a cap according to claim 14 characterized by preparing the projection of a configuration longer than the die length of this elastic body seal part more highly than the height of this elastic body seal member while using an elastic body seal member for the seal part of the ink feed hopper in said ink tank.

[Claim 16] Said cap is a cap according to claim 15 characterized by said two or more ink feed hoppers being divided with having a projection among said two or more elastic body seal members, and this projection entering the slot of said ink tank by said projection.

[Claim 17] Can detach and attach freely to the electrode holder equipped with the ink jet head, and it has a latch lever in the path-of-insertion anterior part to this electrode holder at the engagement section and said path-of-insertion posterior part. It is the ink tank with which an electrode holder is equipped by rotation actuation which used said engagement section as the supporting point. Said ink tank is an ink tank characterized by preparing the ink feed hopper which has two or more ink feed hoppers for supplying the ink of a same system, and supplies ink with more high concentration in said engagement section side.

[Claim 18] The ink tank according to claim 17 characterized by preparing the projection which has a die-length component longer than the path of an ink feed hopper with said high concentration between an ink feed hopper with said high concentration, and other feed hoppers.

[Claim 19] It is the electrode holder which is equipped with an ink jet head and holds an ink tank free [attachment and detachment]. Said ink tank It has a latch lever in the path-of-insertion anterior part to said electrode holder at the engagement section and said path-of-insertion

posterior part. It is the ink tank with which an electrode holder is equipped by rotation actuation which used said engagement section as the supporting point. Said ink tank is an electrode holder characterized by preparing the ink feed hopper which has two or more ink feed hoppers for supplying the ink of a same system, and supplies ink with more high concentration in said engagement section side.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the electrode holder which forms in one ** which stores the ink of two or more colors separately especially, respectively about the ink tank which stored the ink supplied to the ink jet head used for an ink jet recording apparatus, and holds an exchangeable ink tank and this exchangeable exchangeable to equipment.

[0002]

[Description of the Prior Art] Conventionally, the recording device which records to record media (only henceforth the "recording paper"), such as paper, cloth, a sheet plastic, and a sheet for OHP, is proposed as a gestalt which can carry the recording head by various recording methods, for example, a wire dot method, the sensible-heat method, the hot printing method, and the ink jet method.

[0003] Especially an ink jet recording device is used as the handicap provided to the printer as printing terminals, such as the output means of information processing system, for example, a copying machine, facsimile, an electronic typewriter, a word processor, and a workstation, or a personal computer, a host computer, an optical disk unit, video equipment, etc., or a portable printer, and is commercialized.

[0004] Irradiate the method which carries out the regurgitation of the ink, it makes the electromagnetic wave of a thing, laser, etc. using electric machine conversion objects, such as a piezo-electric element, generate heat according to the method which generates the energy for it from the recording head used with such an ink jet recording device, and the thing which makes an ink droplet breathe out in the operation by this generation of heat, or the thing which makes a liquid heat by the electric thermal-conversion component which has an exoergic resistor is known. Moreover, as for the ink tank for supplying ink to a recording head, it is common that an outline configuration is carried out by the ink absorber, the container which contains this ink absorber, and the covering device material which closes this.

[0005] What has a thing, and the recording head and ink tank of the type with which they were mutually fixed and these recording heads and an ink tank were unified removable to mutual is known. Also in which type, a recording head and positioning between ink tanks are important, and positioning at the time of the carriage of an ink jet recording apparatus etc. being equipped with these members is also an important matter concerning printing grace.

[0006] In order to enable attachment and detachment in fewer tooth spaces in a comparatively small ink jet recording apparatus as an attachment-and-detachment device for positioning in the case of equipping carriage with the so-called head cartlidge of one apparatus when equipping carriage with a recording head removable to mutual [which was mentioned above], and an ink tank, respectively or, the device with which is made to move head cartlidges, such as an ink tank, in two or more directions by actuation of a lever etc., and it equips is known.

[0007] However, the conventional structure which is moved in two or more above directions, and detaches and attaches an ink tank and a head cartlidge needs complicated structure for the carriage itself. Therefore, there is a possibility that only the part which prepared the configuration cannot cause enlargement of equipment, and cannot offer a small printer, and attachment-and-detachment actuation may become comparatively complicated. Therefore, it is important to obtain the configuration in which much more miniaturization of equipment is attained when using such an attachment-and-detachment device, and it is easier actuation or a easier device, does not have un-arranging at the time of attachment and detachment, and positioning accuracy moreover is not reduced.

[0008] for example, in JP,8-58107,A, JP,8-224883,A, and JP,8-276601,A In order to attain the above-mentioned purpose, while having a feed hopper for supplying outside the ink for record held in the interior By it being inserted in opening of a box-like ink tank electrode holder, and being held free [attachment and detachment], and an ink tank electrode holder being equipped In the ink tank which a feed hopper opens for free passage with the ink incorporation means of an ink tank electrode holder The base which counters with the bottom wall of opening of an ink tank electrode holder in case an ink tank electrode holder is equipped, While the pawl-like projection which the inclined plane was formed in the arris part which the end side contiguous to this base crosses, and was formed in this end side at the ink tank electrode holder and which falls out and fits into a stop hole is prepared Invention characterized by for the latch lever in which the latch pawl combined with the engagement hole formed in the ink tank electrode holder was formed being elastically supported by the other end side, and preparing it in it is proposed.

[0009]

[Problem(s) to be Solved by the Invention] By the way, in an ink jet head in recent years, as mentioned above, some which use the shade ink (for example, dark yellow, a dark Magenta, dark cyanogen, light yellow, a light Magenta, light cyanogen) for acquiring the image quality of what goes to a miniaturization, the thing which faces to a mass ink tank aiming at a low running cost, or the photograph average are in the inclination of multipolarization. The number (it is the same as the number of the ink feed hoppers of an ink tank) of a tank [especially / a mass ink tank or the ink tank for shade ink] of the joints (joint section) of that weight becomes size from an old ink tank, and the ink tank and the ink discharge-head section of an electrode-holder member increases. Then, this invention persons came to recognize that the point shown in the following as a result of repeating examination wholeheartedly to an above-mentioned ink tank and an above-mentioned electrode holder serves as an important technical problem from the standpoint of a prospective view especially.

[0010] 1) Since the amount of the ink held in the interior of an ink tank also increases, the pressure by the weight of that ink needs to become large compared with what also has the small pressure which acts on a feed hopper part, and for this reason, it is necessary to take into consideration enough prevention of the color mixture by the ink leakage from the feed hopper of each color ink at the time of attachment-and-detachment actuation.

[0011] 2) It is desirable to perform smoothly fixed actuation in the case of wearing of an ink tank, and to combine certainly many feed hoppers and the bond part by the side of a head.

[0012] 3) Since that impact will become comparatively big if an ink tank should fall, it is necessary to protect a latch pawl from this impact.

[0013] 4) It is also necessary to offer a seal means of the optimal feed hopper by which the ink tank which can realize ink supply stabilized also after the ink tank passed through the various posture change in the circulation process is offered, and the leakage of ink can be certainly

prevented in a circulation process.

[0014] Moreover, when it was necessary to take into consideration the color mixture to dark ink and light ink and when the ink tank into which the ink of same systems, such as shade ink, went independently is used, and old urethane sponge etc. was used as an ink supporter in addition to the above-mentioned technical problem, since the ink tank was opaque, an ink piece could not be checked, but there was a case where insecurity was given to users, such as a printer.

[0015] Furthermore, if the seal means used in the circulation process mentioned above is explained to a detail, the approach of sticking a film-like thing on the ink feed hopper of an ink container, the method of equipping with the cap which prepares the elastic body for carrying out the seal of the ink feed hopper of an ink container to the mold member fabricated with resin etc., and is formed, etc. are learned by using a binder as this seal means, or carrying out heat welding.

[0016] However, the ink-proof nature of a binder poses a problem, and the approach of sticking a film on an ink container by using a binder has the problem that an usable ingredient will be limited by the melting nature of the resin and film resin which are used for the ink container etc., when carrying out heat welding. moreover, in a film-like sealant, when a user removes a film from the ink container, even if it comes out rarely and is, the ink adhering to a film may scatter.

[0017] Moreover, in the cap for ink container seals, it is possible that the ink adhering to the seal formed with the elastic body soils a user's hand etc. Therefore, to use this cap, it is necessary to make it the structure of being hard to touch a sealing surface with a user. Moreover, naturally this kind of cap also needs to make it not separate simply in the process of circulation.

[0018] In addition, it sets on this kind of cap (henceforth a PD cap). An ink tank which holds the ink of two or more colors for every receipt room as mentioned above, When the liquid for making the color molecule currently used for ink in order to raise the water resisting property of the ink on recorded media etc. condense is held in the same tank as the ink usually used, If the liquid which it causes [liquid] ink color change that different-species ink is mixed in the circulation process of an ink tank, and makes especially a color molecule condense is mixed with usual ink Ink fixes on that spot, and since there is a possibility that ink may wake up gas supply pressure failure, it is necessary to prevent mixing of such ink.

[0019] The purpose of this invention has the place which it is made in order to solve an above-mentioned technical problem, and is made into the purpose in offering the ink tank and PD cap which can prevent the color mixture by ink leakage etc. good in the time of the attachment and detachment in the ink jet recording device of an ink tank, and a circulation process. Moreover, it is in offering the ink jet cartridge which equipped one with the ink tank and the ink tank electrode holder, or this electrode holder which can ensure [smoothly and] wearing of an ink tank.

[0020]

[Means for Solving the Problem] Therefore, in this invention, it can detach and attach freely to the electrode holder equipped with the ink jet head. It is the ink tank which has a latch lever in the path-of-insertion anterior part to this electrode holder at the engagement section and said path-of-insertion posterior part. Said ink tank has two or more ink feed hoppers in the field contiguous to the part which has said engagement section and said latch lever, respectively, and it is characterized by preparing the slot parallel to said path of insertion at least between lots among these two or more ink feed hoppers.

[0021] It is the electrode holder which is equipped with an ink jet head and holds an ink tank free [attachment and detachment]. Moreover, said ink tank It is the ink tank which has a latch lever in the path-of-insertion anterior part to an electrode holder at the engagement section and said

path-of-insertion posterior part. Said ink tank has two or more ink feed hoppers in the field contiguous to the part which has said engagement section and said latch lever, respectively, and it is characterized by preparing the slot parallel to said path of insertion at least between lots among these two or more ink feed hoppers.

[0022] Furthermore, it can detach and attach freely to the electrode holder equipped with the ink jet head. It is the ink tank which has a latch lever in the path-of-insertion anterior part to this electrode holder at the engagement section and said path-of-insertion posterior part. The ink tank by which it has two or more ink feed hoppers in the field contiguous to the part which has said engagement section and said latch lever, respectively, and the slot parallel to said path of insertion is established in it at least between lots among these two or more ink feed hoppers, It is characterized by having the electrode holder equipped with said ink jet head.

[0023] Furthermore, it can detach and attach freely to the electrode holder equipped with the ink jet head. It is the ink tank which has a latch lever in the path-of-insertion anterior part to this electrode holder at the engagement section and said path-of-insertion posterior part. It has two or more ink feed hoppers in the field contiguous to the part which has said engagement section and said latch lever, respectively, and is characterized by being attached free [attachment and detachment on the ink tank by which the parallel slot is prepared with said path of insertion] between lots at least among these two or more ink feed hoppers.

[0024] Furthermore, it can detach and attach freely to the electrode holder equipped with the ink jet head. It has a latch lever in the path-of-insertion anterior part to this electrode holder at the engagement section and said path-of-insertion posterior part. It is the ink tank with which an electrode holder is equipped by rotation actuation which used said engagement section as the supporting point, and said ink tank has two or more ink feed hoppers for supplying the ink of a same system, and it is characterized by preparing the ink feed hopper which supplies ink with more high concentration in said engagement section side.

[0025] It is the electrode holder which is equipped with an ink jet head and holds an ink tank free [attachment and detachment]. Furthermore, said ink tank It has a latch lever in the path-of-insertion anterior part to said electrode holder at the engagement section and said path-of-insertion posterior part. It is the ink tank with which an electrode holder is equipped by rotation actuation which used said engagement section as the supporting point, and said ink tank has two or more ink feed hoppers for supplying the ink of a same system, and it is characterized by preparing the ink feed hopper which supplies ink with more high concentration in said engagement section side.

[0026] When it is what supplies the ink of a color in which the ink feed hoppers separated by this slot differ since a slot is formed along a direction parallel to the direction of attachment-and-detachment actuation of that ink tank in the field in which two or more ink feed hoppers of an ink tank were arranged according to the above configuration, it can prevent that ink flowing and reaching the ink feed hopper of another side by this slot, even when ink leaks from a feed hopper temporarily [while].

[0027]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained to a detail with reference to a drawing.

[0028] Drawing 1 is the perspective view showing the electrode holder 300 which holds the ink tank 400 concerning 1 operation gestalt of this invention, and this tank on carriage, and is a **** Fig. from an ink feed hopper about the ink tank 400. Moreover, drawing 2 is the perspective view in which fracturing an electrode holder 300 in part and showing it, and is drawing showing

especially a connection with the ink tank 400.

[0029] An electrode holder 300 equips one with the ink jet head 100 so that it may be mentioned later, and in the carriage of an ink jet recording apparatus, it is equipped with it free [attachment and detachment]. as shown in drawing 1 and drawing 2 , as for this electrode holder 300, the top face was opened wide -- it is formed so that the cube type may be accomplished mostly, and the upper half of one end face of this cube type may cut and lack and a flange 302 may project from that notch part. Furthermore, as a flection 340, the upper half inclines in the method of outside, and, as for the end face which counters the above-mentioned end side, extends. Moreover, six chimney-stack-like supply pipes 330 with which the perimeter was enclosed by the pars basilaris ossis occipitalis by the elastic member 304, and the filter 332 was formed at the tip are formed, and, thereby, an electrode holder 300 can supply six kinds of ink of the ink tank 400 to the ***** ink jet head 100 by equipping an electrode holder 300 with the ink tank 400. Namely, the supply pipe 330 of an electrode holder 300 contacts the ink absorber in which that filter part 332 was formed by the ink feed hopper 401 of the ink tank 400, and an elastic member 304 carries out the seal of the perimeter of the ink feed hopper 401, and the perimeter of a supply pipe 330 at this time. Thereby, good ink supply can be performed, preventing evaporation of ink, and leakage. An elastic member 304 can be formed so that sufficient elastic force can be acted for the above-mentioned seal, for example, so that a part of cross-section configuration of the junction direction may turn into a configuration of breadth a trumpet configuration or an end. Moreover, in case it equips with the ink tank 400, the rib 335 which engages with the slot 410 formed in the base is formed in the pars basilaris ossis occipitalis of an electrode holder 300. Thereby, while being able to increase the reinforcement of an electrode holder 300, the guide member of wearing actuation of a tank 400 can also be made.

[0030] Furthermore, while regulating a motion of the ink tank 400 at the time of wearing of the ink tank 400 and desorption, inside [which makes two side faces of the cube type configuration of an electrode holder 300] each wall, the 1st guide section 310 of the shape of a guide rail which makes the smooth motion possible counters mutually, and is prepared in it. This guide section 310 is formed from the hollow section 310 prepared so that the flection 340 of inclination guide-rail section 310a which inclined downward from the upper limb of the above-mentioned wall, level guide-rail section 310b which extends almost horizontally, and an electrode holder 300 might be touched.

[0031] Moreover, mostly, the omission stop hole 320 with which the projection 405 of the three shape of a pawl of the edge in which the flection 340 of an electrode holder 300 is formed prepared in the ink tank 400 at the bottom (at the bottom [near]) is engaged corresponds, and three pieces are prepared. Furthermore, the passage formation member 350 in which the passage 351a, 351b, and 351c for leading ink to the ink jet head 100 from the supply pipe 330 which corresponds, respectively was formed is formed in the field on the background of the base of an electrode holder 300 (refer to drawing 1). As for this passage formation member 350, being formed with a transparent ingredient is desirable, the condition of ink, such as a bubble mixed in the ink led to the ink jet head 100 by this through the passage 351a, 351b, and 351c formed in the interior of the passage formation member 350 or ink, can be viewed, and the ink piece in the ink tank 400 can be checked by mixing of a bubble. With this operation gestalt, although it is the configuration that the passage 351a, 351b, and 351c of the ink of three colors in the ink of six colors can be viewed, it cannot be necessary to necessarily view the ink of a total color, and the insecurity of users, such as a printer, can be mitigated according to the thing with the highest operating frequency for which the ink of yellow (yellow) can be viewed, for example.

[0032] Moreover, in the bottom of the flange 302 of an electrode holder 300, the engagement hole 321 with which the latch pawl 403 of the latch lever 402 of the ink tank 400 is engaged is formed. The guide section 312 of this flange 302 makes the 2nd guide section so that the base of the ink tank 400 may guide that motion in contact with the time of wearing of the ink tank 400 and desorption.

[0033] As shown in drawing 1, the ink jet head 100 will be attached in the field on the background at the base of a stowage of the ink tank 400 in an electrode holder 300, and will be positioned in carriage in a predetermined location by being equipped on the carriage of the ink jet recording apparatus which an electrode holder 300 mentions later.

[0034] With this operation gestalt, the ink of ** and light 2 classes is used about each ink of yellow (Y), a Magenta (M), and cyanogen (C). Therefore, the ink jet head 100 which carries out the regurgitation of the ink jet head 100 of Y, M, and C which carries out the regurgitation of the dark ink, respectively, and the light ink of Y, M, and C, respectively is formed. That is, in each ink jet head, the delivery group which dark **** of Y, M, and C becomes from a predetermined number for every ink of ** is prepared, and a liquid route, a liquid room, etc. for every ink are formed inside each head according to this. And the ink of a class which the electric thermal-conversion component which generates the heat energy used for the ink regurgitation is formed, and corresponds to the liquid room for every ink through the supply pipe 330 or liquid routes 351a-351c of an electrode holder, respectively is supplied to the liquid route corresponding to each delivery.

[0035] The ink tank 400 holds six kinds of ink mentioned above at the separate receipt room divided by the predetermined member, respectively, a porous ink absorber is stored in each receipt room so that that most may be occupied, and this ink absorber holds ink according to capillary force. And a feed hopper 401 is formed in the pars basilaris ossis occipitalis of each receipt room, and the ink held at the ink absorber is supplied to an ink jet head side through this feed hopper 401. That is, a fibrous ink absorber is formed, to each ink feed hopper 401, the capillary force of this absorber is set greatly, and, thereby, the good ink supply of it is attained from the capillary force of the absorber holding the ink of the receipt interior of a room at it so that it may mention later in drawing 5.

[0036] Arrangement of the ink feed hopper 401 in this operation gestalt is defined as follows here.

[0037] The arrangement location of the ink feed hopper 401 prepared for every ink of various kinds is defined mainly in consideration of making to make dirt of an ink tank own [by it] into the minimum and prevention of color mixture, or effect by color mixture into the minimum, when ink leaks from the ink feed hopper 401. That is, although a user will grasp and treat the grasping section 412 of the ink tank 400 in the case of wearing of the ink tank 400 or desorption, the projection 405 prepared in the edge of that base in the posture of the ink tank 400 in this case serves as the bottom.

[0038] In this case, in order to make dirt of an ink tank own [by ink leakage] into the minimum, it is desirable for the ink feed hopper 401 to be arranged by projection 405 rather than the grasping section 412 in a near location. It is because the part soiled in escaped ink by this can be lessened more.

[0039] Next, in order to prevent the color mixture between Y, M, and C each ink, in the posture of an ink tank when a user grasps the ink tank 400, it is necessary for the feed hopper of the ink of other colors not to exist in the direction in which escaped ink flows. For this reason, with this operation gestalt, the ink feed hopper of each ink of Y, M, and C is arranged in the direction

which is a direction where the ink which leaked with the above-mentioned posture flows about ** and each light ink and where a slot 410 extends, and the direction which intersects perpendicularly.

[0040] Furthermore, temporarily, also when one ink entered and carries out color mixture of the arrangement between feed hopper 401 of ** of each ink color, and each light ink to the feed hopper of another side, it arranges the ink feed hopper of light ink to the upstream in the flow of the ink in the above-mentioned posture so that the effect may serve as the minimum. Even when dark ink is temporarily used for record with the above-mentioned color mixture, it is because the case of light ink does not have effect of [such] on the concentration.

[0041] In arrangement of the ink feed hopper 401 mentioned above, with this operation gestalt, the amount of maintenance of light ink is made [more] from viewpoints, such as those consumption, than dark ink about ** of the ink tank 400, and the amount of maintenance of light ** ink. As shown in drawing 1, in the interior of an ink tank, with a bridgewall 413, each receipt room of each ** and light ink is divided, dark ink is contained by left-hand side among this drawing, and, more specifically, as for each color ink, light ink is contained by right-hand side. The feed hopper 401 of each ** and light ink can be formed in the pars basilaris ossis occipitalis of a receipt room which corresponds, respectively by this, and structure about an ink feed hopper can be made simpler. That is, even when following the conditions of the ink feed hopper arrangement mentioned above, even if it does not prepare special configurations, such as ink passage which continues a receipt room and the ink feed hopper 401, for example, a feed hopper can be prepared in the pars basilaris ossis occipitalis of a direct ink receipt room, and it becomes possible to make structure about an ink feed hopper simple by this.

[0042] Moreover, since the base of the receipt room is prepared widely in the case of the ink feed hopper 401 of light ink, the degree of freedom for carrying out arrangement by the projection 405 side soon according to the feed hopper arrangement conditions mentioned above also becomes large.

[0043] With this operation gestalt, the projection 411 which has a die-length component longer than the path of these feed hoppers between ** of each color and the feed hopper of light ** ink from viewpoints, such as color mixture prevention, in addition to defining arrangement of the above-mentioned ink feed hopper appropriately is formed. Moreover, a slot 410 is formed between the ink feed hoppers of each ink color. Even if ink leaks, before the ink will reach other feed hoppers by these heights and the slot, the ink flow can be prevented or a direction can be changed.

[0044] When an electrode holder 300 is equipped, in order to carry out the fixed lock of the ink tank itself down the part in which the grasping section 412 of the ink tank 400 was formed, the latch lever 402 is formed. That end section is formed in the outer wall section of a tank 400, and one, and this lever 402 makes possible the own variation rate of a lever which used this edge as the supporting point. Moreover, the latch pawl 403 is formed in the center section of the lever 402. While two or more projections 405 further mentioned above are formed in the ink tank 400, the projection 404 for a guide is formed in the middle of the front of a side face. Furthermore, the side-attachment-wall section 406 which has in a part the grasping section 412 mentioned above is formed in the near edge in which the latch lever 402 was formed.

[0045] As shown in drawing 3, a latch lever 402 extends toward the method of outside near the bottom surface part of an ink tank side attachment wall, and is in the location usually shown by the drawing solid line with the elasticity of the supporting-point part as shown in this drawing. On the other hand, in case an electrode holder 300 is equipped with the ink tank 400, the location

which it can engage with the flange 302 of an electrode holder 300, and can displace, and the latch pawl 403 engages with the engagement hole of an electrode holder further at the time of wearing, and fixes wearing of an ink tank can be taken.

[0046] Finally the force of act from the member engage at the time of wearing since it can displace to the location which show a latch lever 402 with the broken line of max and drawing 3 also when it be any when the time of wearing and an impact be add , although it could displaced as mentioned above also when the exteriors when , as for this latch lever 402 , for example , an ink tank fall to an impact be added , and impulse force will act on the side attachment wall section 406 .

[0047] That is, when shown in the broken line of drawing 3 , the whole latch lever 402 is located in a way among the side-attachment-wall parts 406, and is stored inside the side attachment wall. If it puts in another way, the side-attachment-wall part 406 will have extended in the method of outside more highly than the thickness of a latch lever 402.

[0048] Thereby, at the time of wearing in the electrode holder 300 of the ink tank 400, when the side-attachment-wall section 406 of an ink tank mainly engages with the flange 302 of an electrode holder 300, the actuation of smooth wearing etc. of the outer diameter of the side-attachment-wall section 406 is attained [having the curvilinear section and] conjointly. Moreover, also when an impact joins a latch lever, the side-attachment-wall section 406 will receive the force, and it can prevent that impulse force joins the latch lever itself. Since there is little deformation by elastic deformation especially near the supporting-point section of a latch lever, it becomes possible [preventing that the impact from the outside is added directly] at the supporting-point section of a latch lever 402 by not being concerned with the condition of latch levers, such as attachment and detachment with a tank, but covering completely by the side-attachment-wall part 406.

[0049] In addition, this side-attachment-wall part 406 intervenes from the ink tank lower part to the section in the middle of an ink tank, and has composition prepared except for the corner by the side of the tip of a latch lever. When the side-attachment-wall part was extended to the ink tank topmost part and impacts, such as fall, are added, there is a possibility that a part of side-attachment-wall part may be missing, or the whole side-attachment-wall part may be missing. For this reason, a side-attachment-wall part is carried out to to the section in the middle of the wall of an ink tank, and is considered as a configuration in which an impact does not join a direct side-attachment-wall part. On the other hand, since the supporting-point section of a latch lever exists near the bottom surface part of an ink tank for engagement-related [with the holder mentioned later] in the case of this operation gestalt, it is related with this part. It not only prevents the breakage from the impact from the outside, but by a side-attachment-wall part lessening the height gradually toward a base, and considering as a minute curved-surface configuration, as mentioned above, it can perform smooth wearing in the case of adhesion in an electrode holder. Furthermore, this operation gestalt is raising the dependability of a side attachment wall more by having formed the reinforcing rib 407 for reinforcement of the side-attachment-wall part 406 on the strength.

[0050] By making it the above configurations, it becomes possible to protect certainly the elastic latch lever which is a device important in the case of attachment and detachment of the ink tank 400, and attachment and detachment of a positive ink tank are attained.

[0051] In addition, although protection of a latch lever was performed in the form where the both-sides wall of an ink tank was extended, in this example, you may be the projection which protects said latch lever from the supporting point of a latch lever on both sides along with a

point, without restricting to this as a protection member.

[0052] In order to equip an electrode holder 300 with the ink tank 400 explained above, first, an electrode holder 300 escapes from the projection 405 of the shape of a pawl of the ink tank 400, and it aligns and inserts in the stop hole 320, next the latch pawl 403 of the latch lever 402 of the opposite side of the ink tank 400 is made to engage with the engagement hole 321 of an electrode holder 300. The both-ends side of the ink tank 400 engages with an electrode holder 300, and is held by this, and the ink tank 400 is positioned correctly, and an electrode holder 300 is certainly connected with the ink tank 400, and it is unified.

[0053] Drawing 4 is drawing explaining a motion of the ink tank 400 at the time of equipping an electrode holder 300 with the ink tank 400.

[0054] The location A shown all over this drawing is the first phase where the ink tank 400 was put into the electrode holder 300, and the location B shows the phase of a motion being regulated by the guide member 310 of an electrode holder 300, and going to the last location C.

[0055] First, the projection 404 which is illustrated and which was prepared in predetermined height from the base in the point of the ink tank 400 when the ink tank 400 was inserted into the electrode holder 300 from the point in the location A like engages with inclination guide-rail section 310a of the guide section 310 of an electrode holder 300. And according to insertion actuation of an ink tank, projection 404 moves along with level guide-rail section 310b from inclination guide-rail section 310a. In this case, the smooth wearing actuation of a front part is attained that what is necessary is just for an operator to have the grasping section 412 of the ink tank 400, and to push the ink tank 400 since projection 404 is supported on the guide member 310. Moreover, since the height from the base of the ink tank is appropriately set to have mentioned above, projection 404 can be detached and attached, without interfering with the ink supply pipe 330 grade by which the part below the projection 404 of an ink tank was prepared in the pars basilaris ossis occipitalis of an electrode holder 300. If it puts in another way, while it is not necessary to make an ink tank configuration into a configuration which avoids the interference in consideration of interference with the electrode-holder element at the time of attachment and detachment and this secures the maximum ink capacity, it will become possible to perform attachment-and-detachment actuation smoothly.

[0056] Finally the ink tank 400 goes to a location C through a location B. In this case, an electrode holder 300 escapes from the projection 405 of the front end lower part of the ink tank 400, and it is inserted in the stop hole 320 and engaged so that clearly also from drawing 4 . Subsequently, by pushing the posterior part of the ink tank 400 in the direction of drawing Nakaya mark D, a latch lever 402 is pushed in exceeding the guide member 312 of the border of a flange 302, and the latch pawl 403 is stopped at the edge of the engagement hole 321. Thereby, the ink feed hopper 401 of the ink tank 400 is certainly contacted by the supply pipe 330 of an electrode holder 300. In addition, in case it rotates and equips with the ink tank 400 to an electrode holder 300, since a latch lever 402 is displaced inside [side-attachment-wall section 406] right-and-left both sides as mentioned above, the latch lever itself does not interfere in it with the flange of an electrode holder etc., and the smooth attachment-and-detachment actuation of it is attained.

[0057] As mentioned above, in the stowed position C shown in drawing 4 , the ink absorber formed in the feed hopper 401 in the supply pipe 330 and the ink tank 400 of an electrode holder 300 contacts, and supply of positive ink is performed. Moreover, in this case, the elastic member 304 prepared in the surroundings of a supply pipe 330 deforms in the vertical direction, and even when the seal of the perimeter of the ink feed hopper 401 of the ink tank 400 and the perimeter

of the supply pipe 330 of an electrode holder 300 should be carried out good and there should be ink leakage, this can be prevented good.

[0058] On the other hand, in order to demount the ink tank 400 from an electrode holder 300 By opening the latch pawl 403 wide from the edge of the engagement hole 321 of an electrode holder 300, solving engagement by pushing a latch lever 402 in the direction of arrow-head E in drawing 4 , and pulling out with the posterior part of the ink tank 400 after that While the projection 405 of the ink tank 400 falls out and being pulled out from the stop hole 320, projection 404 becomes depressed, it is pulled out from section 310c, and desorption is performed by the reverse order with the time of wearing along with a guide 310.

[0059] In addition, since the actuation of most is performed where an ink tank is made slanting, the up tooth space of the ink tank 400 can be managed with min, and, as for wearing in the electrode holder 300 of the ink tank 400, and desorption, can also make small the dimension of the vertical direction of the body of an ink jet recording device.

[0060] Moreover, the reaction force from the electrode holder 300 which a tank 400 receives at the time of wearing of the ink tank 400 mentioned above totals the reaction force F1 by deformation of an elastic member 304, the reaction force F2 by a supply pipe 330 pushing the ink supporter in the ink tank 400, and the reaction force F3 by deformation of a latch lever 402. Compared with the case where one kind of ink is used when using six kinds of ink like this operation gestalt since it is proportional to the number of the classes of the ink (the number of joint) mostly in being the ink tank into which multicolor ink, such as shade ink, went especially, about 6 times as many reaction force as this will be received. For this reason, with this operation gestalt, when using the elastic member which is in the inclination of especially reaction force which becomes large as a seal member, it can consider as the sealant or elastic member by the deflection deformation and the compression set which have not the seal by conventional simple compression deformation like the usual O ring but the shape of a chimney stack like an elastic member 304, and a trumpet configuration, and reaction force of an elastic member 304 can be made into a small thing by this.

[0061] Furthermore, with this operation gestalt, since arrangement of the feed hopper in the ink tank 400 has been arranged to abbreviation bilateral symmetry centering on the direction of [at the time of attachment and detachment of the tank] so that clearly also from drawing 1 , above-mentioned reaction force at the time of wearing can be made into abbreviation bilateral symmetry, and while the actuation by which it was stabilized at the time of wearing is attained, thereby, the pressure welding of a uniform supply pipe and the feed hopper section becomes possible at the time of wearing.

[0062] The force in which an operator, furthermore, pushes a joint location, i.e., the junction location in the ink supply pipe 330, in addition at the time of ink tank wearing by [used as the supporting point] escaping and considering as the location below 1/2 or less, i.e., the one half, of the distance of the stop hole 302 and the back end section (location which an operator pushes) of the ink tank 400 can be made small.

[0063] Drawing 5 (A) and (B) are drawings explaining compression of the ink absorber which holds ink in the ink tank of this operation gestalt, and this drawing (A) is a sectional view showing the A-A cross section and B-B cross section in this drawing (B). In addition, this Fig. shows the structure of the tank only about the ink of one color of Y, M, and C, and illustration of the ink feed hopper 401 of the light ink section is omitted.

[0064] As mentioned above, the ink absorber 416 is contained by the receipt room of shade each ink, and these hold dark ink and light ink in it, respectively. These ink absorbers 416 are

compressed in the direction which crosses the absorber of that bottom alpha smell lever to be shown in the B-B sectional view of drawing 5 (A). This is because the above-mentioned slot 410 is formed between the stowages of each color ink, and even if it kept it by making a feed hopper side into the upper part over the long period of time at the time of the PD while unnecessary ink oozed in the ink absorber lower part and it was able to prevent ** by this, the ink near the feed hopper can be held and it can realize stable ink supply.

[0065] Moreover, the fibrous absorber 415 with the separate ink absorber 416 is formed in the ink feed hopper 401 as mentioned above. For this reason, the ink absorber 416 of that upper part is compressed in the ink supply direction to be shown in the cross hatching section of the A-A sectional view of drawing 5 (A), and this drawing (B). By this, capillary force of this part can be relatively enlarged to other parts, consequently it becomes easy to collect surrounding ink to this ink feed hopper upper part, and good ink supply is attained.

[0066] In addition, the atmospheric-air free passage hole 418 is formed in each ink room.

[0067] Moreover, since it can bear when it falls in the condition of having been equipped with the big ink tank 400 of weight as an ingredient used for each part material of this operation gestalt, as for an electrode holder 300, it is desirable to make from an ingredient with high impact strength, and it is transparent, and when that it is the ingredient which can be welded [300] forms an ink jet head with sufficient productivity, it is desirable. [of the passage formation member 350] As mentioned above, denaturation polyphenylene oxide (PPO) can be used for an electrode holder 300 with an operation gestalt, and transparence polystyrene can be used for the passage formation member 350.

[0068] Drawing 6 is the sectional view showing the condition of having attached the cap (henceforth a PD cap) used in the circulation process etc. to the ink tank 400 mentioned above. Moreover, drawing 7 is the outline perspective view of the above-mentioned PD cap. In drawing 6 , 1 is a PD cap and 400 is the ink tank mentioned above.

[0069] Although the PD cap 1 consists of mold shaping which fabricated resin, such as polypropylene, with this operation gestalt, it may use other quality of the materials, without being limited only to this. Two or more projections 9 of each formed in coincidence at the time of shaping are formed in the cap 1. 3 is an elastic body seal member for a cap to carry out the seal of the ink feed hopper 401 of the ink tank 4002, is formed by fabricating cap 1 and two colors of elastomers, and is being fixed to the body of a cap. The quality of the material of this elastic body 3 cannot be limited only to an elastomer, either, rubber can be used, and it can insert in also about the fixed approach to cap 1 body, and can also consider as a formula etc.

[0070] As mentioned above, the ink tank 400 had the ink receipt room corresponding to each ink of Y, M, and C, and has contained the ink absorber holding the ink corresponding to each.

[0071] When treating the ink tank 400 in a circulation process etc., it attaches so that it may separate from the PD cap 1 with the seal function for preventing the ink leakage and ink evaporation from the ink feed hopper 401 in the time of fall etc. easily neither by the impact nor torsion.

[0072] This PD cap 1 is fixed by making each crevice 422 of the both-sides side of the ink tank 400 carry out fitting of the cap rock section 7 of Toride 8. At this time, when the elastic body 3 of cap 1 carries out the seal of the perimeter of the ink feed hopper 401 of an ink tank, the leakage of ink, evaporation, etc. can be prevented.

[0073] In addition, for impacts, such as fall at the time of the PD etc., and vibration, the ink in the ink tank 400 leaks and even an elastic body 3 may flow out. In this case, although extent with the ink which is going to leak is pulled back by the ink absorber 416 in an ink tank, some ink

which leaked and came out may remain somewhat on an elastic body 3. The amount of ink which remains on an elastic body 3 does not become that there is nothing although it is possible to lessen by making small the clearance between an elastic body 3 and an ink tank. When the cyanogen ink which the ink which adhered on this elastic body 3 may scatter when a user demounts the PD cap 1 from an ink tank, and adhered on the elastic body 3 in this case disperses and it adheres to the ink feed hopper 401 of yellow ink, adhering cyanogen ink is drawn in the yellow ink interior of a room, and the trial of ink may change.

[0074] Then, he forms the projection 9 higher than elastic body 3 height between the elastic bodies 3 which carry out the seal of the ink feed hopper 401 of each ink, and is trying for the ink which adhered on the elastic body 3 not to disperse in the ink hold room of a different color in this invention operation gestalt. Moreover, as shown in drawing 7, the die-length a of projection 9 lengthens rather than die-length b of the seal section of an elastic body 3. In this operation gestalt, a dimension is set to about 18mm to b dimension of about 15mm. The ink which began to leak when a maze-like clearance should be formed of projection 9 and the slot 410 established in the ink tank 400 and ink should begin to leak from between the ink feed hopper 401 in the PD and elastic bodies 3, as shown in drawing 6 stops furthermore, reaching near [feed hopper 401] easily different color ink. Thereby, it can make to prevent color mixture further into a positive thing. In this operation gestalt, although the amount of insertion to the slot 410 of projection 9 is about 2mm, since the width of face of a slot 410 is comparatively as narrow as about 2-3mm, the clearance between the shape of an effective maze can be formed.

[0075] Moreover, a cap can be made hard for projection 9 to be resisting to the torsion deformation within the flat surface of cap 1, and to separate. Furthermore, although it becomes easy to touch the elastic body 3 to which ink adhered after demounting cap 1 from an ink tank since the width of face of cap 1 becomes large like this operation gestalt when an ink tank is what contains the ink of two or more colors, a user can also prevent soiling a hand etc. accidentally by forming the projection 9.

[0076] In addition, as for the width of face of the slot 410 where the projection 9 prepared in the cap 1 enters and is crowded, it is desirable to make it as small as possible to reduce the space where the magnitude of the ink tank which contains two or more colors which were mentioned above is comparatively small, and useless as much as possible, and make [many] the amount of ink receipt. However, in order to prevent scattering of the ink which adhered on the elastic body 3 in one side, the one where the height of projection 9 is higher is good. However, in this operation gestalt, when the height of such a configuration 9, i.e., a projection, is high and a configuration with the narrow width of face of a clearance 10 is carried out, there is a possibility that it may be inserted into the projection 9 fang furrow 410, and removal actuation of cap 1 may become complicated. In order to solve such a trouble, it is desirable to design spacing of a projection and a slot appropriately.

[0077] Moreover, even if it forms projection 9 with the same quality of the material as an elastic body 3 and projection 9 is inserted into the slot of an ink tank at the time of removal of cap 1, since projection 9 the very thing is an elastic body, removal can also be made easy. In this case, it also becomes possible by using projection 9 and an elastic body 3 as the continuous member, and setting the gate to one to simplify shaping equipment.

[0078] Drawing 8 and drawing 9 are drawings showing the ink tank and electrode holder concerning other operation gestalten of this invention, and are the same drawing as drawing 1 and drawing 2.

[0079] The ink tank and electrode holder of this operation gestalt can be equivalent to three kinds

of ink, Y, M, and C, and can apply this invention also in this case.

[0080] Drawing 10 is the outline perspective view showing the ink jet recording device concerning 1 operation gestalt of this invention.

[0081] In carriage 501, it is equipped with each electrode holder 300 free [attachment and detachment] according to the device in which it does not illustrate, using an ink tank and an electrode holder, and the ink tank about black ink (K) and an electrode holder about Y, M, and C which mentioned above the ink jet recording apparatus of this operation gestalt. Carriage 501 is connected to some belts 502 stretched by one pair of pulleys 503 by which engage with a guide rail 504 possible [sliding], and a rotation drive is carried out by the non-illustrated motor. Thereby, carriage 501 becomes movable [which met the guide rail 504]. Moreover, by conveying the recording paper 506 as recorded media the specified quantity every according to non-illustrated carriage, and performing the scan of the ink jet head by migration of carriage for every conveyance of this recording paper, record of an image etc. is made in the record paper and it goes by the lower part of carriage 501.

[0082] In addition, at the end of the successive range of carriage 501, the field in which the regurgitation recovery unit 600 was formed, for example, the delivery of each ink jet head was arranged with the cap 601 can be covered.

[0083] To say nothing of [the ink held in an ink container] not being what is limited to these, although yellow, a Magenta, cyanogen, etc. explained concretely, in each above-mentioned example, a liquid which makes an ink color molecule condense may be further contained as a class of liquid held.

[0084]

[Effect of the Invention] Since a slot is formed along a direction parallel to the direction of attachment-and-detachment actuation of the ink tank in the field in which two or more ink feed hoppers of an ink tank were arranged according to this invention so that clearly from the above explanation When it is what supplies the ink of a color in which the ink feed hoppers separated by this slot differ, it can prevent that ink flowing and reaching the ink feed hopper of another side by this slot, even when ink leaks from a feed hopper temporarily [while].

[0085] Consequently, even when there should be ink leakage from an ink feed hopper in the time of attachment-and-detachment actuation of an ink tank etc., the color mixture of ink can be prevented appropriately, and it becomes possible to record always good grace.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the electrode holder which forms in one ** which stores the ink of two or more colors separately especially, respectively about the ink tank which stored the ink supplied to the ink jet head used for an ink jet recording apparatus, and holds an exchangeable ink tank and this exchangeable exchangeable to equipment.

PRIOR ART

[Description of the Prior Art] Conventionally, the recording device which records to record media (only henceforth the "recording paper"), such as paper, cloth, a sheet plastic, and a sheet for OHP, is proposed as a gestalt which can carry the recording head by various recording methods, for example, a wire dot method, the sensible-heat method, the hot printing method, and the ink jet method.

[0003] Especially an ink jet recording device is used as the handicap provided to the printer as printing terminals, such as the output means of information processing system, for example, a copying machine, facsimile, an electronic typewriter, a word processor, and a workstation, or a personal computer, a host computer, an optical disk unit, video equipment, etc., or a portable printer, and is commercialized.

[0004] Irradiate the method which carries out the regurgitation of the ink, it makes the electromagnetic wave of a thing, laser, etc. using electric machine conversion objects, such as a piezo-electric element, generate heat according to the method which generates the energy for it from the recording head used with such an ink jet recording device, and the thing which makes an ink droplet breathe out in the operation by this generation of heat, or the thing which makes a liquid heat by the electric thermal-conversion component which has an exoergic resistor is known. Moreover, as for the ink tank for supplying ink to a recording head, it is common that an outline configuration is carried out by the ink absorber, the container which contains this ink absorber, and the covering device material which closes this.

[0005] What has a thing, and the recording head and ink tank of the type with which they were mutually fixed and these recording heads and an ink tank were unified removable to mutual is known. Also in which type, a recording head and positioning between ink tanks are important, and positioning at the time of the carriage of an ink jet recording apparatus etc. being equipped with these members is also an important matter concerning printing grace.

[0006] In order to enable attachment and detachment in fewer tooth spaces in a comparatively small ink jet recording apparatus as an attachment-and-detachment device for positioning in the case of equipping carriage with the so-called head cartlidge of one apparatus when equipping carriage with a recording head removable to mutual [which was mentioned above], and an ink tank, respectively or, the device with which is made to move head cartlidges, such as an ink tank, in two or more directions by actuation of a lever etc., and it equips is known.

[0007] However, the conventional structure which is moved in two or more above directions, and detaches and attaches an ink tank and a head cartlidge needs complicated structure for the carriage itself. Therefore, there is a possibility that only the part which prepared the configuration cannot cause enlargement of equipment, and cannot offer a small printer, and attachment-and-detachment actuation may become comparatively complicated. Therefore, it is important to obtain the configuration in which much more miniaturization of equipment is attained when using such an attachment-and-detachment device, and it is easier actuation or a easier device, does not have un-arranging at the time of attachment and detachment, and positioning accuracy moreover is not reduced.

[0008] With JP,8-58107,A, JP,8-224883,A, and JP,8-276601,A In order to attain the above-mentioned purpose, while having a feed hopper for supplying outside the ink for record held in the interior By it being inserted in opening of a box-like ink tank electrode holder, and being held free [attachment and detachment], and an ink tank electrode holder being equipped In the ink

tank which a feed hopper opens for free passage with the ink incorporation means of an ink tank electrode holder The base which counters with the bottom wall of opening of an ink tank electrode holder in case an ink tank electrode holder is equipped, While the pawl-like projection which the inclined plane was formed in the arris part which the end side contiguous to this base crosses, and was formed in this end side at the ink tank electrode holder and which falls out and fits into a stop hole is prepared Invention characterized by for the latch lever in which the latch pawl combined with the engagement hole formed in the ink tank electrode holder was formed being elastically supported by the other end side, and preparing it in it is proposed.

EFFECT OF THE INVENTION

[Effect of the Invention] In this invention, a slot is formed along a direction parallel to the direction of attachment-and-detachment actuation of the ink tank in the field in which two or more ink feed hoppers of an ink tank were arranged so that clearly from the above explanation. Therefore, when it is what supplies the ink of a color in which the ink feed hoppers separated by this slot differ, it can prevent that ink flowing and reaching the ink feed hopper of another side by this slot, even when ink leaks from a feed hopper temporarily [while].

[0085] Consequently, even when there should be ink leakage from an ink feed hopper in the time of attachment-and-detachment actuation of an ink tank etc., the color mixture of ink can be prevented appropriately, and it becomes possible to record always good grace.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By the way, in an ink jet head in recent years, as mentioned above, some which use the shade ink (for example, dark yellow, a dark Magenta, dark cyanogen, light yellow, a light Magenta, light cyanogen) for acquiring the image quality of what goes to a miniaturization, the thing which faces to a mass ink tank aiming at a low running cost, or the photograph average are in the inclination of multipolarization. The number (it is the same as the number of the ink feed hoppers of an ink tank) of a tank [especially / a mass ink tank or the ink tank for shade ink] of the joints (joint section) of that weight becomes size from an old ink tank, and the ink tank and the ink discharge-head section of an electrode-holder member increases. Then, this invention persons came to recognize that the point shown in the following as a result of repeating examination wholeheartedly to an above-mentioned ink tank and an above-mentioned electrode holder serves as an important technical problem from the standpoint of a prospective view especially.

[0010] 1) Since the amount of the ink held in the interior of an ink tank also increases, the pressure by the weight of that ink needs to become large compared with what also has the small pressure which acts on a feed hopper part, and for this reason, it is necessary to take into consideration enough prevention of the color mixture by the ink leakage from the feed hopper of each color ink at the time of attachment-and-detachment actuation.

[0011] 2) It is desirable to perform smoothly fixed actuation in the case of wearing of an ink tank, and to combine certainly many feed hoppers and the bond part by the side of a head.

[0012] 3) Since that impact will become comparatively big if an ink tank should fall, it is

necessary to protect a latch pawl from this impact.

[0013] 4) It is also necessary to offer a seal means of the optimal feed hopper by which the ink tank which can realize ink supply stabilized also after the ink tank passed through the various posture change in the circulation process is offered, and the leakage of ink can be certainly prevented in a circulation process.

[0014] Moreover, when it was necessary to take into consideration the color mixture to dark ink and light ink and when the ink tank into which the ink of same systems, such as shade ink, went independently is used, and old urethane sponge etc. was used as an ink supporter in addition to the above-mentioned technical problem, since the ink tank was opaque, an ink piece could not be checked, but there was a case where insecurity was given to users, such as a printer.

[0015] Furthermore, if the seal means used in the circulation process mentioned above is explained to a detail, the approach of sticking a film-like thing on the ink feed hopper of an ink container, the method of equipping with the cap which prepares the elastic body for carrying out the seal of the ink feed hopper of an ink container to the mold member fabricated with resin etc., and is formed, etc. are learned by using a binder as this seal means, or carrying out heat welding.

[0016] However, the ink-proof nature of a binder poses a problem, and the approach of sticking a film on an ink container by using a binder has the problem that an usable ingredient will be limited by the melting nature of the resin and film resin which are used for the ink container etc., when carrying out heat welding. moreover, in a film-like sealant, when a user removes a film from the ink container, even if it comes out rarely and is, the ink adhering to a film may scatter.

[0017] Moreover, in the cap for ink container seals, it is possible that the ink adhering to the seal formed with the elastic body soils a user's hand etc. Therefore, to use this cap, it is necessary to make it the structure of being hard to touch a sealing surface with a user. Moreover, naturally this kind of cap also needs to make it not separate simply in the process of circulation.

[0018] In addition, it sets on this kind of cap (henceforth a PD cap). An ink tank which holds the ink of two or more colors for every receipt room as mentioned above, When the liquid for making the color molecule currently used for ink in order to raise the water resisting property of the ink on recorded media etc. condense is held in the same tank as the ink usually used, If the liquid which it causes [liquid] ink color change that different-species ink is mixed in the circulation process of an ink tank, and makes especially a color molecule condense is mixed with usual ink Ink fixes on that spot, and since there is a possibility that ink may wake up gas supply pressure failure, it is necessary to prevent mixing of such ink.

[0019] The purpose of this invention has the place which it is made in order to solve an above-mentioned technical problem, and is made into the purpose in offering the ink tank and PD cap which can prevent the color mixture by ink leakage etc. good in the time of the attachment and detachment in the ink jet recording device of an ink tank, and a circulation process. Moreover, it is in offering the ink jet cartridge which equipped one with the ink tank and the ink tank electrode holder, or this electrode holder which can ensure [smoothly and] wearing of an ink tank.

MEANS

[Means for Solving the Problem] Therefore, in this invention, it can detach and attach freely to the electrode holder equipped with the ink jet head. It is the ink tank which has a latch lever in the path-of-insertion anterior part to this electrode holder at the engagement section and said path-of-insertion posterior part. Said ink tank has two or more ink feed hoppers in the field contiguous to the part which has said engagement section and said latch lever, respectively, and it is characterized by preparing the slot parallel to said path of insertion at least between lots among these two or more ink feed hoppers.

[0021] It is the electrode holder which is equipped with an ink jet head and holds an ink tank free [attachment and detachment]. Moreover, said ink tank It is the ink tank which has a latch lever in the path-of-insertion anterior part to an electrode holder at the engagement section and said path-of-insertion posterior part. Said ink tank has two or more ink feed hoppers in the field contiguous to the part which has said engagement section and said latch lever, respectively, and it is characterized by preparing the slot parallel to said path of insertion at least between lots among these two or more ink feed hoppers.

[0022] Furthermore, it can detach and attach freely to the electrode holder equipped with the ink jet head. It is the ink tank which has a latch lever in the path-of-insertion anterior part to this electrode holder at the engagement section and said path-of-insertion posterior part. The ink tank by which it has two or more ink feed hoppers in the field contiguous to the part which has said engagement section and said latch lever, respectively, and the slot parallel to said path of insertion is established in it at least between lots among these two or more ink feed hoppers, It is characterized by having the electrode holder equipped with said ink jet head.

[0023] Furthermore, it can detach and attach freely to the electrode holder equipped with the ink jet head. It is the ink tank which has a latch lever in the path-of-insertion anterior part to this electrode holder at the engagement section and said path-of-insertion posterior part. It has two or more ink feed hoppers in the field contiguous to the part which has said engagement section and said latch lever, respectively, and is characterized by being attached free [attachment and detachment on the ink tank by which the parallel slot is prepared with said path of insertion] between lots at least among these two or more ink feed hoppers.

[0024] Furthermore, it can detach and attach freely to the electrode holder equipped with the ink jet head. It has a latch lever in the path-of-insertion anterior part to this electrode holder at the engagement section and said path-of-insertion posterior part. It is the ink tank with which an electrode holder is equipped by rotation actuation which used said engagement section as the supporting point, and said ink tank has two or more ink feed hoppers for supplying the ink of a same system, and it is characterized by preparing the ink feed hopper which supplies ink with more high concentration in said engagement section side.

[0025] It is the electrode holder which is equipped with an ink jet head and holds an ink tank free [attachment and detachment]. Furthermore, said ink tank It has a latch lever in the path-of-insertion anterior part to said electrode holder at the engagement section and said path-of-insertion posterior part. It is the ink tank with which an electrode holder is equipped by rotation actuation which used said engagement section as the supporting point, and said ink tank has two or more ink feed hoppers for supplying the ink of a same system, and it is characterized by preparing the ink feed hopper which supplies ink with more high concentration in said engagement section side.

[0026] When it is what supplies the ink of a color in which the ink feed hoppers separated by this slot differ since a slot is formed along a direction parallel to the direction of attachment-and-detachment actuation of that ink tank in the field in which two or more ink feed hoppers of an ink tank were arranged according to the above configuration, it can prevent that ink flowing and reaching the ink feed hopper of another side by this slot, even when ink leaks from a feed hopper temporarily [while].

[0027]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained to a detail with reference to a drawing.

[0028] Drawing 1 is the perspective view showing the electrode holder 300 which holds the ink tank 400 concerning 1 operation gestalt of this invention, and this tank on carriage, and is a **** Fig. from an ink feed hopper about the ink tank 400. Moreover, drawing 2 is the perspective view in which fracturing an electrode holder 300 in part and showing it, and is drawing showing especially a connection with the ink tank 400.

[0029] An electrode holder 300 equips one with the ink jet head 100 so that it may be mentioned later, and in the carriage of an ink jet recording apparatus, it is equipped with it free [attachment and detachment]. as shown in drawing 1 and drawing 2, as for this electrode holder 300, the top face was opened wide -- it is formed so that the cube type may be accomplished mostly, and the upper half of one end face of this cube type may cut and lack and a flange 302 may project from that notch part. Furthermore, as a flection 340, the upper half inclines in the method of outside, and, as for the end face which counters the above-mentioned end side, extends. Moreover, six chimney-stack-like supply pipes 330 with which the perimeter was enclosed by the pars basilaris ossis occipitalis by the elastic member 304, and the filter 332 was formed at the tip are formed, and, thereby, an electrode holder 300 can supply six kinds of ink of the ink tank 400 to the ***** ink jet head 100 by equipping an electrode holder 300 with the ink tank 400. Namely, the supply pipe 330 of an electrode holder 300 contacts the ink absorber in which that filter part 332 was formed by the ink feed hopper 401 of the ink tank 400, and an elastic member 304 carries out the seal of the perimeter of the ink feed hopper 401, and the perimeter of a supply pipe 330 at this time. Thereby, good ink supply can be performed, preventing evaporation of ink, and leakage. An elastic member 304 can be formed so that sufficient elastic force can be acted for the above-mentioned seal, for example, so that a part of cross-section configuration of the junction direction may turn into a configuration of breadth a trumpet configuration or an end. Moreover, in case it equips with the ink tank 400, the rib 335 which engages with the slot 410 formed in the base is formed in the pars basilaris ossis occipitalis of an electrode holder 300. Thereby, while being able to increase the reinforcement of an electrode holder 300, the guide member of wearing actuation of a tank 400 can also be made.

[0030] Furthermore, while regulating a motion of the ink tank 400 at the time of wearing of the ink tank 400 and desorption, inside [which makes two side faces of the cube type configuration of an electrode holder 300] each wall, the 1st guide section 310 of the shape of a guide rail which makes the smooth motion possible counters mutually, and is prepared in it. This guide section 310 is formed from the hollow section 310 prepared so that the flection 340 of inclination guide-rail section 310a which inclined downward from the upper limb of the above-mentioned wall, level guide-rail section 310b which extends almost horizontally, and an electrode holder 300 might be touched.

[0031] Moreover, mostly, the omission stop hole 320 with which the projection 405 of the three shape of a pawl of the edge in which the flection 340 of an electrode holder 300 is formed

prepared in the ink tank 400 at the bottom (at the bottom [near]) is engaged corresponds, and three pieces are prepared. Furthermore, the passage formation member 350 in which the passage 351a, 351b, and 351c for leading ink to the ink jet head 100 from the supply pipe 330 which corresponds, respectively was formed is formed in the field on the background of the base of an electrode holder 300 (refer to drawing 1). As for this passage formation member 350, being formed with a transparent ingredient is desirable, the condition of ink, such as a bubble mixed in the ink led to the ink jet head 100 by this through the passage 351a, 351b, and 351c formed in the interior of the passage formation member 350 or ink, can be viewed, and the ink piece in the ink tank 400 can be checked by mixing of a bubble. With this operation gestalt, although it is the configuration that the passage 351a, 351b, and 351c of the ink of three colors in the ink of six colors can be viewed, it cannot be necessary to necessarily view the ink of a total color, and the insecurity of users, such as a printer, can be mitigated according to the thing with the highest operating frequency for which the ink of yellow (yellow) can be viewed, for example.

[0032] Moreover, in the bottom of the flange 302 of an electrode holder 300, the engagement hole 321 with which the latch pawl 403 of the latch lever 402 of the ink tank 400 is engaged is formed. The guide section 312 of this flange 302 makes the 2nd guide section so that the base of the ink tank 400 may guide that motion in contact with the time of wearing of the ink tank 400 and desorption.

[0033] As shown in drawing 1 , the ink jet head 100 will be attached in the field on the background at the base of a stowage of the ink tank 400 in an electrode holder 300, and will be positioned in carriage in a predetermined location by being equipped on the carriage of the ink jet recording apparatus which an electrode holder 300 mentions later.

[0034] With this operation gestalt, the ink of ** and light 2 classes is used about each ink of yellow (Y), a Magenta (M), and cyanogen (C). Therefore, the ink jet head 100 which carries out the regurgitation of the ink jet head 100 of Y, M, and C which carries out the regurgitation of the dark ink, respectively, and the light ink of Y, M, and C, respectively is formed. That is, in each ink jet head, the delivery group which dark **** of Y, M, and C becomes from a predetermined number for every ink of ** is prepared, and a liquid route, a liquid room, etc. for every ink are formed inside each head according to this. And the ink of a class which the electric thermal-conversion component which generates the heat energy used for the ink regurgitation is formed, and corresponds to the liquid room for every ink through the supply pipe 330 or liquid routes 351a-351c of an electrode holder, respectively is supplied to the liquid route corresponding to each delivery.

[0035] The ink tank 400 holds six kinds of ink mentioned above at the separate receipt room divided by the predetermined member, respectively, a porous ink absorber is stored in each receipt room so that that most may be occupied, and this ink absorber holds ink according to capillary force. And a feed hopper 401 is formed in the pars basilaris ossis occipitalis of each receipt room, and the ink held at the ink absorber is supplied to an ink jet head side through this feed hopper 401. That is, a fibrous ink absorber is formed, to each ink feed hopper 401, the capillary force of this absorber is set greatly, and, thereby, the good ink supply of it is attained from the capillary force of the absorber holding the ink of the receipt interior of a room at it so that it may mention later in drawing 5 .

[0036] Arrangement of the ink feed hopper 401 in this operation gestalt is defined as follows here.

[0037] The arrangement location of the ink feed hopper 401 prepared for every ink of various kinds is defined mainly in consideration of making to make dirt of an ink tank own [by it] into

the minimum and prevention of color mixture, or effect by color mixture into the minimum, when ink leaks from the ink feed hopper 401. That is, although a user will grasp and treat the grasping section 412 of the ink tank 400 in the case of wearing of the ink tank 400 or desorption, the projection 405 prepared in the edge of that base in the posture of the ink tank 400 in this case serves as the bottom.

[0038] In this case, in order to make dirt of an ink tank own [by ink leakage] into the minimum, it is desirable for the ink feed hopper 401 to be arranged by projection 405 rather than the grasping section 412 in a near location. It is because the part soiled in escaped ink by this can be lessened more.

[0039] Next, in order to prevent the color mixture between Y, M, and C each ink, in the posture of an ink tank when a user grasps the ink tank 400, it is necessary for the feed hopper of the ink of other colors not to exist in the direction in which escaped ink flows. For this reason, with this operation gestalt, the ink feed hopper of each ink of Y, M, and C is arranged in the direction which is a direction where the ink which leaked with the above-mentioned posture flows about ** and each light ink and where a slot 410 extends, and the direction which intersects perpendicularly.

[0040] Furthermore, temporarily, also when one ink entered and carries out color mixture of the arrangement between feed hopper 401 of ** of each ink color, and each light ink to the feed hopper of another side, it arranges the ink feed hopper of light ink to the upstream in the flow of the ink in the above-mentioned posture so that the effect may serve as the minimum. Even when dark ink is temporarily used for record with the above-mentioned color mixture, it is because the case of light ink does not have effect of [such] on the concentration.

[0041] In arrangement of the ink feed hopper 401 mentioned above, with this operation gestalt, the amount of maintenance of light ink is made [more] from viewpoints, such as those consumption, than dark ink about ** of the ink tank 400, and the amount of maintenance of light ** ink. As shown in drawing 1 , in the interior of an ink tank, with a bridgeway 413, each receipt room of each ** and light ink is divided, dark ink is contained by left-hand side among this drawing, and, more specifically, as for each color ink, light ink is contained by right-hand side. The feed hopper 401 of each ** and light ink can be formed in the pars basilaris ossis occipitalis of a receipt room which corresponds, respectively by this, and structure about an ink feed hopper can be made simpler. That is, even when following the conditions of the ink feed hopper arrangement mentioned above, even if it does not prepare special configurations, such as ink passage which continues a receipt room and the ink feed hopper 401, for example, a feed hopper can be prepared in the pars basilaris ossis occipitalis of a direct ink receipt room, and it becomes possible to make structure about an ink feed hopper simple by this.

[0042] Moreover, since the base of the receipt room is prepared widely in the case of the ink feed hopper 401 of light ink, the degree of freedom for carrying out arrangement by the projection 405 side soon according to the feed hopper arrangement conditions mentioned above also becomes large.

[0043] With this operation gestalt, the projection 411 which has a die-length component longer than the path of these feed hoppers between ** of each color and the feed hopper of light ** ink from viewpoints, such as color mixture prevention, in addition to defining arrangement of the above-mentioned ink feed hopper appropriately is formed. Moreover, a slot 410 is formed between the ink feed hoppers of each ink color. Even if ink leaks, before the ink will reach other feed hoppers by these heights and the slot, the ink flow can be prevented or a direction can be changed.

[0044] When an electrode holder 300 is equipped, in order to carry out the fixed lock of the ink tank itself down the part in which the grasping section 412 of the ink tank 400 was formed, the latch lever 402 is formed. That end section is formed in the outer wall section of a tank 400, and one, and this lever 402 makes possible the own variation rate of a lever which used this edge as the supporting point. Moreover, the latch pawl 403 is formed in the center section of the lever 402. While two or more projections 405 further mentioned above are formed in the ink tank 400, the projection 404 for a guide is formed in the middle of the front of a side face. Furthermore, the side-attachment-wall section 406 which has in a part the grasping section 412 mentioned above is formed in the near edge in which the latch lever 402 was formed.

[0045] As shown in drawing 3, a latch lever 402 extends toward the method of outside near the bottom surface part of an ink tank side attachment wall, and is in the location usually shown by the drawing solid line with the elasticity of the supporting-point part as shown in this drawing. On the other hand, in case an electrode holder 300 is equipped with the ink tank 400, the location which it can engage with the flange 302 of an electrode holder 300, and can displace, and the latch pawl 403 engages with the engagement hole of an electrode holder further at the time of wearing, and fixes wearing of an ink tank can be taken.

[0046] Finally the force of act from the member engage at the time of wearing since it can displace to the location which show a latch lever 402 with the broken line of max and drawing 3 also when it be any when the time of wearing and an impact be add, although it could displaced as mentioned above also when the exteriors when, as for this latch lever 402, for example, an ink tank fall to an impact be added, and impulse force will act on the side attachment wall section 406.

[0047] That is, when shown in the broken line of drawing 3, the whole latch lever 402 is located in a way among the side-attachment-wall parts 406, and is stored inside the side attachment wall. If it puts in another way, the side-attachment-wall part 406 will have extended in the method of outside more highly than the thickness of a latch lever 402.

[0048] Thereby, at the time of wearing in the electrode holder 300 of the ink tank 400, when the side-attachment-wall section 406 of an ink tank mainly engages with the flange 302 of an electrode holder 300, the actuation of smooth wearing etc. of the outer diameter of the side-attachment-wall section 406 is attained [having the curvilinear section and] conjointly. Moreover, also when an impact joins a latch lever, the side-attachment-wall section 406 will receive the force, and it can prevent that impulse force joins the latch lever itself. Since there is little deformation by elastic deformation especially near the supporting-point section of a latch lever, it becomes possible [preventing that the impact from the outside is added directly] at the supporting-point section of a latch lever 402 by not being concerned with the condition of latch levers, such as attachment and detachment with a tank, but covering completely by the side-attachment-wall part 406.

[0049] In addition, this side-attachment-wall part 406 intervenes from the ink tank lower part to the section in the middle of an ink tank, and has composition prepared except for the corner by the side of the tip of a latch lever. When the side-attachment-wall part was extended to the ink tank topmost part and impacts, such as fall, are added, there is a possibility that a part of side-attachment-wall part may be missing, or the whole side-attachment-wall part may be missing. For this reason, a side-attachment-wall part is carried out to to the section in the middle of the wall of an ink tank, and is considered as a configuration in which an impact does not join a direct side-attachment-wall part. On the other hand, since the supporting-point section of a latch lever exists near the bottom surface part of an ink tank for engagement-related [with the holder

mentioned later] in the case of this operation gestalt, it is related with this part. It not only prevents the breakage from the impact from the outside, but by a side-attachment-wall part lessening the height gradually toward a base, and considering as a minute curved-surface configuration, as mentioned above, it can perform smooth wearing in the case of adhesion in an electrode holder. Furthermore, this operation gestalt is raising the dependability of a side attachment wall more by having formed the reinforcing rib 407 for reinforcement of the side-attachment-wall part 406 on the strength.

[0050] By making it the above configurations, it becomes possible to protect certainly the elastic latch lever which is a device important in the case of attachment and detachment of the ink tank 400, and attachment and detachment of a positive ink tank are attained.

[0051] In addition, although protection of a latch lever was performed in the form where the both-sides wall of an ink tank was extended, in this example, you may be the projection which protects said latch lever from the supporting point of a latch lever on both sides along with a point, without restricting to this as a protection member.

[0052] In order to equip an electrode holder 300 with the ink tank 400 explained above, first, an electrode holder 300 escapes from the projection 405 of the shape of a pawl of the ink tank 400, and it aligns and inserts in the stop hole 320, next the latch pawl 403 of the latch lever 402 of the opposite side of the ink tank 400 is made to engage with the engagement hole 321 of an electrode holder 300. The both-ends side of the ink tank 400 engages with an electrode holder 300, and is held by this, and the ink tank 400 is positioned correctly, and an electrode holder 300 is certainly connected with the ink tank 400, and it is unified.

[0053] Drawing 4 is drawing explaining a motion of the ink tank 400 at the time of equipping an electrode holder 300 with the ink tank 400.

[0054] The location A shown all over this drawing is the first phase where the ink tank 400 was put into the electrode holder 300, and the location B shows the phase of a motion being regulated by the guide member 310 of an electrode holder 300, and going to the last location C.

[0055] First, the projection 404 which is illustrated and which was prepared in predetermined height from the base in the point of the ink tank 400 when the ink tank 400 was inserted into the electrode holder 300 from the point in the location A like engages with inclination guide-rail section 310a of the guide section 310 of an electrode holder 300. And according to insertion actuation of an ink tank, projection 404 moves along with level guide-rail section 310b from inclination guide-rail section 310a. In this case, the smooth wearing actuation of a front part is attained that what is necessary is just for an operator to have the grasping section 412 of the ink tank 400, and to push the ink tank 400 since projection 404 is supported on the guide member 310. Moreover, since the height from the base of the ink tank is appropriately set to have mentioned above, projection 404 can be detached and attached, without interfering with the ink supply pipe 330 grade by which the part below the projection 404 of an ink tank was prepared in the pars basilaris ossis occipitalis of an electrode holder 300. If it puts in another way, while it is not necessary to make an ink tank configuration into a configuration which avoids the interference in consideration of interference with the electrode-holder element at the time of attachment and detachment and this secures the maximum ink capacity, it will become possible to perform attachment-and-detachment actuation smoothly.

[0056] Finally the ink tank 400 goes to a location C through a location B. In this case, an electrode holder 300 escapes from the projection 405 of the front end lower part of the ink tank 400, and it is inserted in the stop hole 320 and engaged so that clearly also from drawing 4. Subsequently, by pushing the posterior part of the ink tank 400 in the direction of drawing

Nakaya mark D, a latch lever 402 is pushed in exceeding the guide member 312 of the border of a flange 302, and the latch pawl 403 is stopped at the edge of the engagement hole 321. Thereby, the ink feed hopper 401 of the ink tank 400 is certainly contacted by the supply pipe 330 of an electrode holder 300. In addition, in case it rotates and equips with the ink tank 400 to an electrode holder 300, since a latch lever 402 is displaced inside [side-attachment-wall section 406] right-and-left both sides as mentioned above, the latch lever itself does not interfere in it with the flange of an electrode holder etc., and the smooth attachment-and-detachment actuation of it is attained.

[0057] As mentioned above, in the stowed position C shown in drawing 4 , the ink absorber formed in the feed hopper 401 in the supply pipe 330 and the ink tank 400 of an electrode holder 300 contacts, and supply of positive ink is performed. Moreover, in this case, the elastic member 304 prepared in the surroundings of a supply pipe 330 deforms in the vertical direction, and even when the seal of the perimeter of the ink feed hopper 401 of the ink tank 400 and the perimeter of the supply pipe 330 of an electrode holder 300 should be carried out good and there should be ink leakage, this can be prevented good.

[0058] On the other hand, in order to demount the ink tank 400 from an electrode holder 300 By opening the latch pawl 403 wide from the edge of the engagement hole 321 of an electrode holder 300, solving engagement by pushing a latch lever 402 in the direction of arrow-head E in drawing 4 , and pulling out with the posterior part of the ink tank 400 after that While the projection 405 of the ink tank 400 falls out and being pulled out from the stop hole 320, projection 404 becomes depressed, it is pulled out from section 310c, and desorption is performed by the reverse order with the time of wearing along with a guide 310.

[0059] In addition, since the actuation of most is performed where an ink tank is made slanting, the up tooth space of the ink tank 400 can be managed with min, and, as for wearing in the electrode holder 300 of the ink tank 400, and desorption, can also make small the dimension of the vertical direction of the body of an ink jet recording device.

[0060] Moreover, the reaction force from the electrode holder 300 which a tank 400 receives at the time of wearing of the ink tank 400 mentioned above totals the reaction force F1 by deformation of an elastic member 304, the reaction force F2 by a supply pipe 330 pushing the ink supporter in the ink tank 400, and the reaction force F3 by deformation of a latch lever 402. Compared with the case where one kind of ink is used when using six kinds of ink like this operation gestalt since it is proportional to the number of the classes of the ink (the number of joint) mostly in being the ink tank into which multicolor ink, such as shade ink, went especially, about 6 times as many reaction force as this will be received. For this reason, with this operation gestalt, when using the elastic member which is in the inclination of especially reaction force which becomes large as a seal member, it can consider as the sealant or elastic member by the deflection deformation and the compression set which have not the seal by conventional simple compression deformation like the usual O ring but the shape of a chimney stack like an elastic member 304, and a trumpet configuration, and reaction force of an elastic member 304 can be made into a small thing by this.

[0061] Furthermore, with this operation gestalt, since arrangement of the feed hopper in the ink tank 400 has been arranged to abbreviation bilateral symmetry centering on the direction of [at the time of attachment and detachment of the tank] so that clearly also from drawing 1 , above-mentioned reaction force at the time of wearing can be made into abbreviation bilateral symmetry, and while the actuation by which it was stabilized at the time of wearing is attained, thereby, the pressure welding of a uniform supply pipe and the feed hopper section becomes

possible at the time of wearing.

[0062] The force in which an operator, furthermore, pushes a joint location, i.e., the junction location in the ink supply pipe 330, in addition at the time of ink tank wearing by [used as the supporting point] escaping and considering as the location below 1/2 or less, i.e., the one half, of the distance of the stop hole 302 and the back end section (location which an operator pushes) of the ink tank 400 can be made small.

[0063] Drawing 5 (A) and (B) are drawings explaining compression of the ink absorber which holds ink in the ink tank of this operation gestalt, and this drawing (A) is a sectional view showing the A-A cross section and B-B cross section in this drawing (B). In addition, this Fig. shows the structure of the tank only about the ink of one color of Y, M, and C, and illustration of the ink feed hopper 401 of the light ink section is omitted.

[0064] As mentioned above, the ink absorber 416 is contained by the receipt room of shade each ink, and these hold dark ink and light ink in it, respectively. These ink absorbers 416 are compressed in the direction which crosses the absorber of that bottom alpha smell lever to be shown in the B-B sectional view of drawing 5 (A). This is because the above-mentioned slot 410 is formed between the stowages of each color ink, and even if it kept it by making a feed hopper side into the upper part over the long period of time at the time of the PD while unnecessary ink oozed in the ink absorber lower part and it was able to prevent ** by this, the ink near the feed hopper can be held and it can realize stable ink supply.

[0065] Moreover, the fibrous absorber 415 with the separate ink absorber 416 is formed in the ink feed hopper 401 as mentioned above. For this reason, the ink absorber 416 of that upper part is compressed in the ink supply direction to be shown in the cross hatching section of the A-A sectional view of drawing 5 (A), and this drawing (B). By this, capillary force of this part can be relatively enlarged to other parts, consequently it becomes easy to collect surrounding ink to this ink feed hopper upper part, and good ink supply is attained.

[0066] In addition, the atmospheric-air free passage hole 418 is formed in each ink room.

[0067] Moreover, since it can bear when it falls in the condition of having been equipped with the big ink tank 400 of weight as an ingredient used for each part material of this operation gestalt, as for an electrode holder 300, it is desirable to make from an ingredient with high impact strength, and it is transparent, and when that it is the ingredient which can be welded [300] forms an ink jet head with sufficient productivity, it is desirable. [of the passage formation member 350] As mentioned above, denaturation polyphenylene oxide (PPO) can be used for an electrode holder 300 with an operation gestalt, and transparence polystyrene can be used for the passage formation member 350.

[0068] Drawing 6 is the sectional view showing the condition of having attached the cap (henceforth a PD cap) used in the circulation process etc. to the ink tank 400 mentioned above. Moreover, drawing 7 is the outline perspective view of the above-mentioned PD cap. In drawing 6, 1 is a PD cap and 400 is the ink tank mentioned above.

[0069] Although the PD cap 1 consists of mold shaping which fabricated resin, such as polypropylene, with this operation gestalt, it may use other quality of the materials, without being limited only to this. Two or more projections 9 of each formed in coincidence at the time of shaping are formed in the cap 1. 3 is an elastic body seal member for a cap to carry out the seal of the ink feed hopper 401 of the ink tank 4002, is formed by fabricating cap 1 and two colors of elastomers, and is being fixed to the body of a cap. The quality of the material of this elastic body 3 cannot be limited only to an elastomer, either, rubber can be used, and it can insert in also about the fixed approach to cap 1 body, and can also consider as a formula etc.

[0070] As mentioned above, the ink tank 400 had the ink receipt room corresponding to each ink of Y, M, and C, and has contained the ink absorber holding the ink corresponding to each.

[0071] When treating the ink tank 400 in a circulation process etc., it attaches so that it may separate from the PD cap 1 with the seal function for preventing the ink leakage and ink evaporation from the ink feed hopper 401 in the time of fall etc. easily neither by the impact nor torsion.

[0072] This PD cap 1 is fixed by making each crevice 422 of the both-sides side of the ink tank 400 carry out fitting of the cap rock section 7 of Toride 8. At this time, when the elastic body 3 of cap 1 carries out the seal of the perimeter of the ink feed hopper 401 of an ink tank, the leakage of ink, evaporation, etc. can be prevented.

[0073] In addition, for impacts, such as fall at the time of the PD etc., and vibration, the ink in the ink tank 400 leaks and even an elastic body 3 may flow out. In this case, although extent with the ink which is going to leak is pulled back by the ink absorber 416 in an ink tank, some ink which leaked and came out may remain somewhat on an elastic body 3. The amount of ink which remains on an elastic body 3 does not become that there is nothing although it is possible to lessen by making small the clearance between an elastic body 3 and an ink tank. When the cyanogen ink which the ink which adhered on this elastic body 3 may scatter when a user demounts the PD cap 1 from an ink tank, and adhered on the elastic body 3 in this case disperses and it adheres to the ink feed hopper 401 of yellow ink, adhering cyanogen ink is drawn in the yellow ink interior of a room, and the trial of ink may change.

[0074] Then, he forms the projection 9 higher than elastic body 3 height between the elastic bodies 3 which carry out the seal of the ink feed hopper 401 of each ink, and is trying for the ink which adhered on the elastic body 3 not to disperse in the ink hold room of a different color in this invention operation gestalt. Moreover, as shown in drawing 7, the die-length a of projection 9 lengthens rather than die-length b of the seal section of an elastic body 3. In this operation gestalt, a dimension is set to about 18mm to b dimension of about 15mm. The ink which began to leak when a maze-like clearance should be formed of projection 9 and the slot 410 established in the ink tank 400 and ink should begin to leak from between the ink feed hopper 401 in the PD and elastic bodies 3, as shown in drawing 6 stops furthermore, reaching near [feed hopper 401] easily different color ink. Thereby, it can make to prevent color mixture further into a positive thing. In this operation gestalt, although the amount of insertion to the slot 410 of projection 9 is about 2mm, since the width of face of a slot 410 is comparatively as narrow as about 2-3mm, the clearance between the shape of an effective maze can be formed.

[0075] Moreover, a cap can be made hard for projection 9 to be resisting to the torsion deformation within the flat surface of cap 1, and to separate. Furthermore, although it becomes easy to touch the elastic body 3 to which ink adhered after demounting cap 1 from an ink tank since the width of face of cap 1 becomes large like this operation gestalt when an ink tank is what contains the ink of two or more colors, a user can also prevent soiling a hand etc. accidentally by forming the projection 9.

[0076] In addition, as for the width of face of the slot 410 where the projection 9 prepared in the cap 1 enters and is crowded, it is desirable to make it as small as possible to reduce the space where the magnitude of the ink tank which contains two or more colors which were mentioned above is comparatively small, and useless as much as possible, and make [many] the amount of ink receipt. However, in order to prevent scattering of the ink which adhered on the elastic body 3 in one side, the one where the height of projection 9 is higher is good. However, in this operation gestalt, when the height of such a configuration 9, i.e., a projection, is high and a

configuration with the narrow width of face of a clearance 10 is carried out, there is a possibility that it may be inserted into the projection 9 fang furrow 410, and removal actuation of cap 1 may become complicated. In order to solve such a trouble, it is desirable to design spacing of a projection and a slot appropriately.

[0077] Moreover, even if it forms projection 9 with the same quality of the material as an elastic body 3 and projection 9 is inserted into the slot of an ink tank at the time of removal of cap 1, since projection 9 the very thing is an elastic body, removal can also be made easy. In this case, it also becomes possible by using projection 9 and an elastic body 3 as the continuous member, and setting the gate to one to simplify shaping equipment.

[0078] Drawing 8 and drawing 9 are drawings showing the ink tank and electrode holder concerning other operation gestalten of this invention, and are the same drawing as drawing 1 and drawing 2.

[0079] The ink tank and electrode holder of this operation gestalt can be equivalent to three kinds of ink, Y, M, and C, and can apply this invention also in this case.

[0080] Drawing 10 is the outline perspective view showing the ink jet recording device concerning 1 operation gestalt of this invention.

[0081] In carriage 501, it is equipped with each electrode holder 300 free [attachment and detachment] according to the device in which it does not illustrate, using an ink tank and an electrode holder, and the ink tank about black ink (K) and an electrode holder about Y, M, and C which mentioned above the ink jet recording apparatus of this operation gestalt. Carriage 501 is connected to some belts 502 stretched by one pair of pulleys 503 by which engage with a guide rail 504 possible [sliding], and a rotation drive is carried out by the non-illustrated motor. Thereby, carriage 501 becomes movable [which met the guide rail 504]. Moreover, by conveying the recording paper 506 as recorded media the specified quantity every according to non-illustrated carriage, and performing the scan of the ink jet head by migration of carriage for every conveyance of this recording paper, record of an image etc. is made in the record paper and it goes by the lower part of carriage 501.

[0082] In addition, at the end of the successive range of carriage 501, the field in which the regurgitation recovery unit 600 was formed, for example, the delivery of each ink jet head was arranged with the cap 601 can be covered.

[0083] To say nothing of [the ink held in an ink container] not being what is limited to these, although yellow, a Magenta, cyanogen, etc. explained concretely, in each above-mentioned example, a liquid which makes an ink color molecule condense may be further contained as a class of liquid held.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the perspective view showing the electrode holder with which the ink jet head concerning 1 operation gestalt of this invention was attached, and an ink tank.

[Drawing 2] It is the perspective view fracturing and showing a part of electrode holder shown in drawing 1.

[Drawing 3] It is drawing explaining an operation of the side-attachment-wall section of an ink tank.

[Drawing 4] It is drawing showing wearing actuation of an ink tank gradually.

[Drawing 5] (A) And (B) is a sectional view for explaining compression of the ink absorber contained by the ink tank.

[Drawing 6] It is the sectional view showing the condition of having equipped the ink tank with the PD cap used in the circulation process of an ink tank etc.

[Drawing 7] It is the perspective view showing the relation of the size of each element in the above-mentioned PD cap.

[Drawing 8] It is drawing showing the ink tank and electrode holder concerning other operation gestalten of this invention.

[Drawing 9] It is the perspective view fracturing and showing a part of electrode holder shown in drawing 8 .

[Drawing 10] It is the perspective view showing the outline configuration of the ink jet recording device concerning 1 operation gestalt of this invention.

[Description of Notations]

1 PD Cap

7 Cap Rock Section

8 Toride

9 Projection

100 Ink Jet Head

300 Electrode Holder

302 Flange

304 Elastic Member

310 Guide Section

312 Guide Section

320 Escape and it is Stop Hole.

321 Engagement Hole

330 Supply Pipe

335 Rib

340 Flection

350 Passage Formation Member

400 Ink Tank

401 Ink Feed Hopper

402 Latch Lever

403 Latch Pawl

404 Projection

405 Projection

410 Slot

411 Projected Part

412 Grasping Section

415 Ink Absorber

416 Ink Absorber

501 Carriage

(19)日本国特許庁 (J P)

(12) 公 開 特 許 公 報 (A)

(11)特許出願公開番号

特開平10-286972

(43)公開日 平成10年(1998)10月27日

(51)Int.Cl.⁶

B 4 1 J 2/175

識別記号

F I

B 4 1 J 3/04

1 0 2 Z

審査請求 未請求 請求項の数19 O L (全 13 頁)

(21)出願番号 特願平9-111457

(22)出願日 平成9年(1997)4月28日

(31)優先権主張番号 特願平8-229518

(32)優先日 平8(1996)8月30日

(33)優先権主張国 日本(J P)

(31)優先権主張番号 特願平8-230449

(32)優先日 平8(1996)8月30日

(33)優先権主張国 日本(J P)

(31)優先権主張番号 特願平9-29492

(32)優先日 平9(1997)2月14日

(33)優先権主張国 日本(J P)

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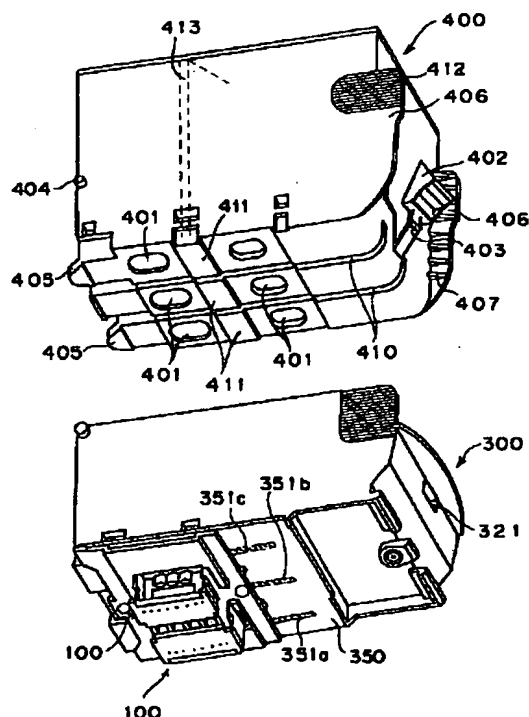
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(54)【発明の名称】 インクタンク、ホルダー、インクジェットカートリッジおよびキャップ

(57)【要約】

【課題】 多種類のインクを各別の収納室毎に収納するインクタンクの装置における着脱動作時に供給口からのインク漏れに起因した混色を防止する。

【解決手段】 インクタンク400において、イエロー(Y)、マゼンタ(M)およびシアン(C)のインクそれぞれのインク供給口401の間に所定の深さの溝410が設けられ、この溝410によって各色インク毎の供給口401が隔てられる。これにより、仮にいずれかのインク供給口401からインク漏れがあったとしても少なくとも異なる色間でインクが混合されることを防止できる。



【特許請求の範囲】

【請求項 1】 インクジェットヘッドを備えたホルダーに対して着脱自在であり、該ホルダーに対する挿入方向前部に係合部および前記挿入方向後部にラッチレバーを有するインクタンクであって、

前記インクタンクはそれぞれ前記係合部および前記ラッチレバーを有する部位と隣接する面に複数のインク供給口を有し、該複数のインク供給口のうち少なくとも一組の間には前記挿入方向と平行な溝が設けられていることを特徴とするインクタンク。

【請求項 2】 前記溝の 2 つで区切られた領域内に同系色のインクを供給するインク供給口が複数設けられていることを特徴とする請求項 1 に記載のインクタンク。

【請求項 3】 前記同系色のインク供給口のうち、より濃度の高いインクを供給するインク供給口が前記係合部側に設けられることを特徴とする請求項 2 に記載のインクタンク。

【請求項 4】 前記溝はその深さ方向において当該溝幅が狭くなるよう形成され、該溝幅に応じて当該インクタンク内部に収納されるインク吸収体が圧縮されることを特徴とする請求項 1 ないし 3 のいずれかに記載のインクタンク。

【請求項 5】 前記ラッチレバーの変位により該ラッチレバーを収納できる保護壁をさらに有したことを特徴とする請求項 1 ないし 4 のいずれかに記載のインクタンク。

【請求項 6】 インクジェットヘッドを備え、インクタンクを着脱自在に保持するホルダーであって、前記インクタンクは、ホルダーに対する挿入方向前部に係合部および前記挿入方向後部にラッチレバーを有するインクタンクであって、

前記インクタンクはそれぞれ前記係合部および前記ラッチレバーを有する部位と隣接する面に複数のインク供給口を有し、該複数のインク供給口のうち少なくとも一組の間には前記挿入方向と平行な溝が設けられていることを特徴とするホルダー。

【請求項 7】 前記ホルダーは、その側面内側にガイド部材が設けられ前記インクタンクの側面の突起を該ガイド部材に沿って案内し、前記係合部を支点として当該インクタンクを回動してホルダーに装着することを特徴とする請求項 6 に記載のホルダー。

【請求項 8】 前記インクタンクと前記ホルダー内のインクジェットヘッドとを接続する接合部およびインクタンク装着時の前記支点間の距離が、装着力作用点と支点との距離の半分以下であることを特徴とする請求項 7 に記載のホルダー。

【請求項 9】 前記接合部に、接合方向の断面形状の一部がラッパ形状である弾性部材を設けたことを特徴とする請求項 7 または 8 に記載のホルダー。

【請求項 1 0】 前記ホルダーの底部にインク流路を形

成する流路形成部材が設けられたことを特徴とする請求項 7 ないし 9 のいずれかに記載のホルダー。

【請求項 1 1】 前記流路形成部材の一部が透明部材で形成されていることを特徴とする請求項 1 0 に記載のホルダー。

【請求項 1 2】 前記ホルダーの内側に設けられる前記ガイド部材は、前記ホルダーの上縁から下向きに傾斜した傾斜ガイドレール部と、傾斜ガイドレール部の下端からほぼ水平に延びる水平ガイドレール部と、水平ガイドレール部の他端に形成された窪み部とを有するガイドレールで構成されたことを特徴とする請求項 7 ないし 1 1 のいずれかに記載のホルダー。

【請求項 1 3】 インクジェットヘッドを備えたホルダーに対して着脱自在であり、該ホルダーに対する挿入方向前部に係合部および前記挿入方向後部にラッチレバーを有するインクタンクであって、それぞれ前記係合部および前記ラッチレバーを有する部位と隣接する面に複数のインク供給口を有し、該複数のインク供給口のうち少なくとも一組の間には前記挿入方向と平行な溝が設けられているインクタンクと、前記インクジェットヘッドを備えたホルダーと、を有したことを特徴とするインクジェットカートリッジ。

【請求項 1 4】 インクジェットヘッドを備えたホルダーに対して着脱自在であり、該ホルダーに対する挿入方向前部に係合部および前記挿入方向後部にラッチレバーを有するインクタンクであって、それぞれ前記係合部および前記ラッチレバーを有する部位と隣接する面に複数のインク供給口を有し、該複数のインク供給口のうち少なくとも一組の間には前記挿入方向と平行な溝が設けられているインクタンクに着脱自在に取付けられることを特徴とするキャップ。

【請求項 1 5】 前記キャップは、前記インクタンクにおけるインク供給口のシール部分に弾性体シール部材を用いると共に、該弾性体シール部材の高さより高く、かつ該弾性体シール部分の長さより長い形状の突起を設けたことを特徴とする請求項 1 4 に記載のキャップ。

【請求項 1 6】 前記キャップは前記複数の弾性体シール部材の間に突起を有し、該突起が前記インクタンクの溝に入り込むことで前記複数のインク供給口が前記突起により仕切られることを特徴とする請求項 1 5 に記載のキャップ。

【請求項 1 7】 インクジェットヘッドを備えたホルダーに対して着脱自在であり、該ホルダーに対する挿入方向前部に係合部および前記挿入方向後部にラッチレバーを有し、前記係合部を支点とした回動動作によりホルダーに装着されるインクタンクであって、前記インクタンクは同系統のインクを供給するためのインク供給口を複数有し、より濃度の高いインクを供給するインク供給口が前記係合部側に設けられていることを

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特徴とするインクタンク。

【請求項 18】 前記濃度の高いインク供給口と他の供給口との間に前記濃度の高いインク供給口の径より長い長さ成分を有する突起を設けたことを特徴とする請求項 17 に記載のインクタンク。

【請求項 19】 インクジェットヘッドを備え、インクタンクを着脱自在に保持するホルダーであって、前記インクタンクは、前記ホルダーに対する挿入方向前部に係合部および前記挿入方向後部にラッチレバーを有し、前記係合部を支点とした回動動作によりホルダーに装着されるインクタンクであって、

前記インクタンクは同系統のインクを供給するためのインク供給口を複数有し、より濃度の高いインクを供給するインク供給口が前記係合部側に設けられていることを特徴とするホルダー。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、インクジェット記録装置に用いられるインクジェットヘッドに供給するインクを貯留したインクタンクに関し、特に、複数色のインクをそれぞれ別個に貯留する室を一体に形成し装置に対し交換可能なインクタンクおよびこれを交換可能に保持するホルダーに関するものである。

【0002】

【従来の技術】従来、紙、布、プラスチックシート、OHP用シート等の記録媒体（以下、単に「記録紙」ともいう）に対して記録を行う記録装置は、種々の記録方式、例えばワイヤードット方式、感熱方式、熱転写方式、インクジェット方式による記録ヘッドを搭載可能な形態として提案されている。

【0003】特に、インクジェット記録装置は、情報処理システムの出力手段、例えば複写機、ファクシミリ、電子タイプライタ、ワードプロセッサ、ワークステーション等の出力端末としてのプリンタ、あるいはパーソナルコンピュータ、ホストコンピュータ、光ディスク装置、ビデオ装置等に具備されるハンディまたはポータブルプリンタとして利用され、かつ商品化されている。

【0004】このようなインクジェット記録装置で用いられる記録ヘッドからインクを吐出する方式は、そのためのエネルギーを発生する方式に応じて、ピエゾ素子などの電気機械変換体を用いたもの、レーザなどの電磁波を照射して発熱させ、この発熱による作用でインク滴を吐出させるもの、あるいは発熱抵抗体を有する電気熱変換素子によって液体を加熱させるもの等が知られている。また、記録ヘッドへインクを供給するためのインクタンクは、インク吸収体と、このインク吸収体を収納する容器と、これを封止する蓋部材とで概略構成されるのが一般的である。

【0005】これら記録ヘッドおよびインクタンクは、それらが相互に固定されて一体化されたタイプのもの

と、記録ヘッドとインクタンクとが相互に着脱可能なものとが知られている。いずれのタイプにおいても記録ヘッドとインクタンク相互の位置決めは重要であり、また、これらの部材がインクジェット記録装置のキャリッジ等に装着される際の位置決めも印字品位に係わる重要な事項である。

【0006】上述した相互に着脱可能な記録ヘッドおよびインクタンクをそれぞれキャリッジに装着する場合あるいは一体型のいわゆるヘッドカートリッジをキャリッジに装着する場合の位置決めのための着脱機構として、比較的小型のインクジェット記録装置においてより少ないスペースでの着脱を可能とするため、レバー等の操作によりインクタンク等あるいはヘッドカートリッジを複数の方向に移動させて装着する機構が知られている。

【0007】しかしながら、上述のような複数の方向に移動させてインクタンクやヘッドカートリッジを着脱する従来の構造は、キャリッジ自体に複雑な構造を必要とする。そのため、その構成を設けた分だけ装置の大型化を招き、小型のプリンタを提供することができない場合があり、また、着脱操作が比較複雑なものとなるおそれがある。従って、このような着脱機構を用いる場合において、装置の一層の小型化を達成し、より簡単な操作あるいは、より簡単な機構で、着脱時の不都合がなく、しかも位置決め精度を低下させることのない構成を得ることは重要である。

【0008】例えば、特開平 8-58107 号、特開平 8-224883 号、特開平 8-276601 号では、上記目的を達成するために、内部に収容した記録用のインクを外部に供給するための供給口を有するとともに、箱状のインクタンクホルダーの開口に挿入されて着脱自在に保持され、インクタンクホルダーに装着されることで、供給口がインクタンクホルダーのインク取り込み手段と連通するインクタンクにおいて、インクタンクホルダーに装着される際に、インクタンクホルダーの開口の底壁と対向する底面と、この底面に隣接する一端面とが交わる稜部に傾斜面が形成され、該一端面に、インクタンクホルダーに形成された抜け止め孔に嵌合する爪状突起が設けられるとともに、他端面に、インクタンクホルダーに形成された係合孔に結合するラッチ爪が設けられたラッチレバーが弾性的に支持されて設けられていることを特徴とする発明を提案している。

【0009】

【発明が解決しようとする課題】ところで、近年のインクジェットヘッドにおいては、上述したように、小型化へと向かうものと、低ランニングコストを目指し、大容量インクタンクへと向かうもの、又は、写真並の画質を得るための濃淡インク（例えば濃イエロー、濃マゼンタ、濃シアン、淡イエロー、淡マゼンタ、淡シアン）を使用するもの等、多極化の傾向にある。特に、大容量のインクタンクや濃淡インク用のインクタンクは、これま

でのインクタンクよりも重量が大になることや、インクタンクとホルダー部材のインク吐出ヘッド部との接合部（ジョイント部）の数（インクタンクのインク供給口の数と同じ）が多くなる。そこで、本発明者らは将来的展望の見地から、上述のインクタンクおよびホルダーに対し鋭意検討を重ねた結果、特に以下に示す点が特に重要な課題となることを認識するに至った。

【0010】1）インクタンク内部に収容されるインクの量も増すことからそのインクの重量による圧力が供給口部分に作用する圧力も小型のものに比べ大きくなり、このため、着脱動作時の各色インクの供給口からのインク漏れによる混色の防止を十分考慮する必要がある。

【0011】2）インクタンクの装着の際の固定動作をスムーズに行い、かつ多くの供給口とヘッド側の結合部を確実に結合することが望ましい。

【0012】3）万一インクタンクが落下した場合その衝撃は比較的大きなものとなるため、この衝撃からラッチ爪を保護する必要もある。

【0013】4）インクタンクがその流通過程における種々の姿勢変化を経た後でも安定したインク供給を実現できるインクタンクを提供し、また、流通過程においてインクの漏れを確実に防止し得る最適な供給口のシール手段を提供することも必要となる。

【0014】また、上記の課題に加えあるいは単独で、濃淡インク等の同系統のインクが入ったインクタンクを用いる場合において濃インクと淡インクに対する混色を考慮する必要がある、また、これまでのウレタンスポンジ等をインク保持体として用いる場合、インクタンクが不透明であるためにインク切れの確認が行えず、プリンタ等の使用者に不安感を与える場合があった。

【0015】さらに、上述した流通過程で用いるシール手段に関して詳細に説明すると、このシール手段として粘着剤を用いたり、熱溶着することにより、フィルム状のものをインク容器のインク供給口に貼り付ける方法や、樹脂等により成形されたモールド部材に、インク容器のインク供給口をシールするための弾性体を設けて形成されるキャップを装着する方法等が知られている。

【0016】しかしながら、粘着剤を用いることによりフィルムをインク容器に貼り付ける方法は、粘着剤の耐インク性が問題となり、また、熱溶着する場合は、インク容器に使用されている樹脂とフィルム樹脂との溶融性等により使用可能な材料が限定されてしまうという問題がある。また、フィルム状のシール材においては、ユーザがフィルムをそのインク容器から剥した場合、まれにであってもフィルムに付着したインクが飛び散る可能性もある。

【0017】また、インク容器シール用キャップの場合、弾性体で形成されたシールに付着したインクがユーザの手などを汚すことが考えられる。従って、このキャップを用いる場合はユーザがシール面に触れにくい構造

にする必要がある。また、当然この種のキャップは、流通の過程において簡単に外れないようにすることも必要である。

【0018】加えて、この種のキャップ（以下、物流キャップともいう）においては、前述したように、複数色のインクを各収納室毎に保持するようなインクタンクや、被記録媒体上のインクの耐水性等を向上させるためインクに使用されている染料分子を凝集させるための液体を通常使用されるインクと同一のタンクにおいて保持する場合、インクタンクの流通過程で異種インク同士等が混ざるとはインク色変化の原因となり、また、特に染料分子を凝集させる液が通常のインクと混合すると、その場でインクが固着してしまい、インクが供給不良を起こす怖れがあるため、このようなインクの混合を防止する必要がある。

【0019】本発明の目的は、上述の課題を解決するためになされたものであり、その目的とするところは、インクタンクのインクジェット記録装置における着脱時および流通過程においてインク漏れによる混色等を良好に防止できるインクタンクおよび物流キャップを提供することにある。また、インクタンクの装着をスムーズかつ確実に行うことができるインクタンクおよびインクタンクホルダーもしくは該ホルダーを一体に備えたインクジェットカートリッジを提供することにある。

【0020】

【課題を解決するための手段】そのために本発明では、インクジェットヘッドを備えたホルダーに対して着脱自在であり、該ホルダーに対する挿入方向前部に係合部および前記挿入方向後部にラッチレバーを有するインクタンクであって、前記インクタンクはそれぞれ前記係合部および前記ラッチレバーを有する部位と隣接する面に複数のインク供給口を有し、該複数のインク供給口のうち少なくとも一組の間には前記挿入方向と平行な溝が設けられていることを特徴とする。

【0021】また、インクジェットヘッドを備え、インクタンクを着脱自在に保持するホルダーであって、前記インクタンクは、ホルダーに対する挿入方向前部に係合部および前記挿入方向後部にラッチレバーを有するインクタンクであって、前記インクタンクはそれぞれ前記係合部および前記ラッチレバーを有する部位と隣接する面に複数のインク供給口を有し、該複数のインク供給口のうち少なくとも一組の間には前記挿入方向と平行な溝が設けられていることを特徴とする。

【0022】さらに、インクジェットヘッドを備えたホルダーに対して着脱自在であり、該ホルダーに対する挿入方向前部に係合部および前記挿入方向後部にラッチレバーを有するインクタンクであって、それぞれ前記係合部および前記ラッチレバーを有する部位と隣接する面に複数のインク供給口を有し、該複数のインク供給口のうち少なくとも一組の間には前記挿入方向と平行な溝が設

けられているインクタンクと、前記インクジェットヘッドを備えたホルダーと、を有したことを特徴とする。

【0023】さらに、インクジェットヘッドを備えたホルダーに対して着脱自在であり、該ホルダーに対する挿入方向前部に係合部および前記挿入方向後部にラッチレバーを有するインクタンクであって、それぞれ前記係合部および前記ラッチレバーを有する部位と隣接する面に複数のインク供給口を有し、該複数のインク供給口のうち少なくとも一組の間には前記挿入方向と平行な溝が設けられているインクタンクに着脱自在に取付けられることを特徴とする。

【0024】さらに、インクジェットヘッドを備えたホルダーに対して着脱自在であり、該ホルダーに対する挿入方向前部に係合部および前記挿入方向後部にラッチレバーを有し、前記係合部を支点とした回動動作によりホルダーに装着されるインクタンクであって、前記インクタンクは同系統のインクを供給するためのインク供給口を複数有し、より濃度の高いインクを供給するインク供給口が前記係合部側に設けられていることを特徴とする。

【0025】さらに、インクジェットヘッドを備え、インクタンクを着脱自在に保持するホルダーであって、前記インクタンクは、前記ホルダーに対する挿入方向前部に係合部および前記挿入方向後部にラッチレバーを有し、前記係合部を支点とした回動動作によりホルダーに装着されるインクタンクであって、前記インクタンクは同系統のインクを供給するためのインク供給口を複数有し、より濃度の高いインクを供給するインク供給口が前記係合部側に設けられていることを特徴とする。

【0026】以上の構成によれば、インクタンクの複数のインク供給口が配設された面において、そのインクタンクの着脱動作の方向に平行な方向に沿って溝が形成されるので、この溝によって隔てられるインク供給口が異なる色のインクを供給するものであるときはこの溝により、仮に一方の供給口からインクが漏れた場合でもそのインクが流れて他方のインク供給口に達することを防止できる。

【0027】

【発明の実施の形態】以下、図面を参照して本発明の実施形態を詳細に説明する。

【0028】図1は本発明の一実施形態に係るインクタンク400およびこのタンクをキャリッジ上において保持するホルダー300を示す斜視図であり、インクタンク400についてはインク供給口から見た図である。また、図2はホルダー300を一部破断して示す斜視図であり、特にインクタンク400との接続部を示す図である。

【0029】ホルダー300は、後述されるようにインクジェットヘッド100を一体に備え、また、インクジェット記録装置のキャリッジにおいて着脱自在に装着さ

れるものである。図1および図2に示されるように、このホルダー300は、上面が開放されたほぼ箱形を成しており、また、この箱形の一方向の端面の上半分が切り欠かれその切欠き部分からフランジ部302が突出するように形成されている。さらに、上記一端面に対向する端面はその上半分が屈曲部340として外方に傾斜して延在する。また、ホルダー300は、その底部に周囲が弾性部材304によって取り囲まれ先端にフィルター332が設けられた煙突状の供給管330が6個設けられ、これにより、インクタンク400がホルダー300に装着されることによってインクタンク400の6種類のインクをそれぞれインクジェットヘッド100に供給することができる。すなわち、ホルダー300の供給管330はそのフィルター部分332をインクタンク400のインク供給口401に設けられたインク吸収体に当接し、また、このとき、弾性部材304はインク供給口401の周囲および供給管330の周囲をシールする。これにより、インクの蒸発および漏れを防止しつつ良好なインク供給を行うことができる。弾性部材304は、上記シールのため十分な弾性力を作用できるよう例えば接合方向の断面形状の一部がラッパ形状または末広りの形状となるよう形成することができる。また、ホルダー300の底部には、インクタンク400を装着する際にその底面に形成された溝410と係合するリブ335が設けられる。これにより、ホルダー300の強度を増すことができるとともにタンク400の装着動作のガイド部材をなすこともできる。

【0030】さらに、ホルダー300の箱形状の2つの側面をなすそれぞれの壁の内側には、インクタンク400の装着および脱着時にインクタンク400の動きを規制すると共に、その円滑な動きを可能とするガイドレール状の第1のガイド部310が互いに対向して設けられている。このガイド部310は、上記壁の上縁から下向きに傾斜した傾斜ガイドレール部310a、ほぼ水平に延在する水平ガイドレール部310bおよびホルダー300の屈曲部340に接するように設けられた窪み部310とから形成されている。

【0031】また、ホルダー300の屈曲部340が設けられる端部のほぼ最下部（底面の近傍）には、インクタンク400に設けられた3個の爪状の突起405が係合する抜け止め孔320が対応して3個設けられている。さらに、ホルダー300の底面の裏側の面には、それぞれ対応する供給管330からインクジェットヘッド100にインクを導くための流路351a、351b、351cが形成された流路形成部材350が設けられている（図1参照）。この流路形成部材350は透明な材料で形成されるのが好ましく、これにより、流路形成部材350の内部に形成された流路351a、351b、351cを介してインクジェットヘッド100に導かれるインクやインクに混入した泡等のインクの状態を目視

して、インクタンク400内のインク切れを泡の混入で確認することができる。本実施形態では、6色のインクの内3色のインクの流路351a, 351b, 351cが目視できる構成であるが、必ずしも全色のインクを目視できる必要はなく、一番使用頻度の高い例えばイエロー（黄色）のインクを目視できることで、プリンタ等の使用者の不安感を軽減することができる。

【0032】また、ホルダー300のフランジ部302の下には、インクタンク400のラッチレバー402のラッチ爪403に係合される係合孔321が設けられている。このフランジ部302のガイド部312はインクタンク400の装着、脱着時にインクタンク400の底面が当接してその動きを案内するよう第2のガイド部をなすものである。

【0033】インクジェットヘッド100は、図1に示すように、ホルダー300においてインクタンク400の収納部底面の裏側の面に取付けられるものであり、ホルダー300が後述するインクジェット記録装置のキャリッジ上に装着されることにより、キャリッジにおいて所定位置に位置決めされることになる。

【0034】本実施形態では、イエロー（Y）、マゼンタ（M）、シアン（C）の各インクについて濃、淡2種類のインクを用いる。そのため、Y、M、Cのそれぞれ濃インクを吐出するインクジェットヘッド100およびY、M、Cの淡インクをそれぞれ吐出するインクジェットヘッド100が設けられる。すなわち、それぞれのインクジェットヘッドにおいて、Y、M、Cの濃または淡のインク毎に所定数からなる吐出口群が設けられており、これに応じて各ヘッド内部では各インク毎の液路および液室等が形成されている。そして、各吐出口に対応する液路には、インク吐出に利用される熱エネルギーを発生する電気熱変換素子が形成され、また、各インク毎の液室にはホルダーの供給管330もしくは液路351a~351cを介してそれぞれ対応する種類のインクが供給される。

【0035】インクタンク400は、上述した6種類のインクをそれぞれ所定の部材で区切られた別個の収納室において保持するものであり、各収納室にはその大部分を占めるように多孔質のインク吸収体が格納されこのインク吸収体が毛管力によってインクを保持する。そして、各収納室の底部には供給口401が設けられ、インク吸収体に保持されたインクはこの供給口401を介してインクジェットヘッド側へ供給される。すなわち、各インク供給口401には、図5にて後述するように、繊維状のインク吸収体が設けられ、この吸収体の毛管力が収納室内のインクを保持する吸収体の毛管力より大きく設定されており、これにより、良好なインク供給が可能となる。

【0036】ここで本実施形態におけるインク供給口401の配置は次のようにして定められている。

【0037】各種類のインク毎に設けられるインク供給口401の配設位置は、インク供給口401からインクが漏れた場合にそれによるインクタンク自身の汚れを最小限とすることおよび混色の防止もしくは混色による影響を最小限とすることを主に考慮して定められる。すなわち、インクタンク400の装着や脱着の際、ユーザーはインクタンク400の把持部412を把持して扱うことになるが、この場合、インクタンク400の姿勢においてその底面の端部に設けられる突起405が最下部となる。

【0038】この場合、インク漏れによるインクタンク自身の汚れを最小限とするには、インク供給口401が、把持部412よりも突起405により近い位置に配置されることが望ましい。これにより、漏れたインクによって汚される部位をより少なくすることができるからである。

【0039】次にY、M、C各インク相互の混色を防止するには、ユーザーがインクタンク400を把持したときのインクタンクの姿勢において、漏れたインクが流れる方向に他の色のインクの供給口が存在していないことが必要となる。このため、本実施形態では、濃、淡インクそれぞれについて、上記姿勢で漏れたインクの流れる方向である、例えば溝410が延在する方向と、直交する方向にY、M、Cの各インクのインク供給口を配列するようにする。

【0040】さらに、各インク色の濃、淡インクそれぞれの供給口401相互の配置は、仮に、一方のインクが他方の供給口に入り込んで混色した場合にも、その影響が最小限となるよう、上記姿勢におけるインクの流れにおいて上流側に淡インクのインク供給口を配置する。上記混色によって仮に濃インクが記録に用いられる場合でも、淡インクの場合がその濃度にそれ程の影響を与えないからである。

【0041】上述したインク供給口401の配置の場合において、本実施形態では、インクタンク400の濃、淡各インクの保持量について、それらの消費量等の観点から濃インクより淡インクの保持量を多くしている。より具体的には、図1に示すように、インクタンク内部において各色インクは仕切り壁413によってそれぞれの濃、淡インクの各収納室が区画され、同図中、左側に濃インクが収納され、右側に淡インクが収納される。これにより、各濃、淡インクの供給口401をそれぞれ対応する収納室の底部に設けることができ、インク供給口に関する構造をより簡易なものとすることができる。すなわち、上述したインク供給口配置の条件に従う場合でも、例えば収納室とインク供給口401とを連続するインク流路等の特別の構成を設けなくても、直接インク収納室の底部に供給口を設けることができ、これによりインク供給口に関する構造を簡易なものとするが可能となる。

【0042】また、淡インクのインク供給口401の場合、その収納室の底面が広く設けられるため、上述した供給口配置条件に応じて突起405側により近く配置するための自由度も大きくなる。

【0043】本実施形態では、混色防止等の観点から、上記インク供給口の配置を適切に定めることに加え、各色の濃、淡各インクの供給口間にこれら供給口の径より長い長さ成分を有する突起411を設ける。また、各インク色のインク供給口間には溝410を設ける。これら、凸部および溝により、仮りにインクが漏れたとしても、そのインクが他の供給口に到達する前に、そのインク流れを阻止するかもしくは方向を変えることができる。

【0044】インクタンク400の把持部412が設けられた部位の下方には、ホルダー300に装着された際にインクタンク自身を固定錠止するためにラッチレバー402が設けられている。このレバー402はその一端部がタンク400の外壁部と一体に形成されて、この端部を支点としたレバー自身の変位を可能としている。また、レバー402の中央部ではラッチ爪403が設けられている。インクタンク400にはさらに上述した複数個の突起405が設けられると共に、側面前方の中ほどにガイド用の突起404が設けられている。さらに、ラッチレバー402が設けられた側の端部には上述した把持部412を一部に有する側壁部406が形成されている。

【0045】図3に示されるように、ラッチレバー402は、インクタンク側壁の底面部近傍から外方に向かって延在し、同図に示すように通常はその支点部分の弾性により図中実線で示す位置にある。一方、インクタンク400がホルダー300に装着される際には、ホルダー300のフランジ302と係合して変位することができ、さらに、装着時にはそのラッチ爪403がホルダーの係合穴と係合してインクタンクの装着を固定化する位置をとることができる。

【0046】このラッチレバー402は、例えばインクタンクが落下した場合等、外部から衝撃が加わった場合にも上述のように変位することができるが、装着時および衝撃が加えられた時のいずれの場合も、ラッチレバー402は、最大、図3の破線で示す位置まで変位可能であることから、装着時に係合する部材から作用する力や衝撃力は最終的に側壁部406に作用することになる。

【0047】すなわち、図3の破線に示す場合、ラッチレバー402の全体は側壁部分406の内方に位置し、その側壁の内側に収められる。換言すれば、側壁部分406はラッチレバー402の厚みより高く外方に延在している。

【0048】これにより、インクタンク400のホルダー300における装着時等には、主にインクタンクの側壁部406がホルダー300のフランジ302と係合す

ることにより、側壁部406の外径が曲線部を有していることを相俟ってスムーズな装着等の動作が可能となる。また、ラッチレバーに衝撃が加わった場合にも、その力は側壁部406が受けることになり、ラッチレバー自体に衝撃力が加わることを防止できる。特に、ラッチレバーの支点部近傍は弾性変形による変形量が少ないために、タンクとの着脱などラッチレバーの状態に関わらず側壁部分406により完全にカバーすることにより、ラッチレバー402の支点部には、直接外部からの衝撃が加わることを防止することが可能となる。

【0049】なお、この側壁部分406はインクタンク下部からインクタンク途中部まで介在しており、ラッチレバーの先端側の角部を除いて設けられた構成となっている。側壁部分がインクタンク最上部まで伸びていると、落下などの衝撃が加わった場合に、側壁部分の一部が欠けるか、もしくは側壁部分全体が欠けてしまう恐れがある。このため側壁部分はインクタンクの壁の途中部までとし、衝撃が直接側壁部分に加わらないような構成としている。一方、本実施形態の場合、ラッチレバーの支点部は後述するホルダとの係合関係のためにインクタンクの底面部近傍に存在しているので、この部分に関しては、側壁部分は底面に向かって徐々にその高さを少なくし、かつ微小曲面形状とすることで、外部からの衝撃からの破損を防止するだけでなく、上述したように、ホルダーへの接着の際にスムーズな装着を行うことができる。さらに、本実施形態では、側壁部分406の強度補強のための補強リブ407を設けていることで、側壁の信頼性をより高めている。

【0050】以上のような構成にすることにより、インクタンク400の着脱の際に重要な機構である、弾性ラッチレバーを確実に保護することが可能となり、確実なインクタンクの着脱が可能となる。

【0051】なお、本実施例ではラッチレバーの保護を、インクタンクの両側壁を延長した形で行ったが、保護部材としてはこれに限ることなく、ラッチレバーの支点から先端部に沿って両側に前記ラッチレバーを保護する突起であってもよい。

【0052】以上説明したインクタンク400をホルダー300に装着するには、先ず、インクタンク400の爪状の突起405をホルダー300の抜け止め孔320に位置合せして嵌め込み、次に、インクタンク400の反対側のラッチレバー402のラッチ爪403をホルダー300の係合孔321に係合させる。これによって、インクタンク400の両端面がホルダー300に係合されて保持され、インクタンク400が正確に位置決められインクタンク400とホルダー300が確実に接続されて一体化される。

【0053】図4はインクタンク400をホルダー300に装着する際のインクタンク400の動きを説明する図である。

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【0054】同図中に示す位置Aはインクタンク400をホルダー300に入れた最初の段階であり、位置Bはホルダー300のガイド部材310により動きが規制されて最終位置Cへ向かう段階を示している。

【0055】先ず、図示される様に、位置Aにおいて、インクタンク400が先端部からホルダー300内に挿入されると、インクタンク400の先端部においてその底面から所定の高さに設けられた突起404がホルダー300のガイド部310の傾斜ガイドレール部310aと係合する。そして、インクタンクの挿入動作に従い、突起404は傾斜ガイドレール部310aから水平ガイドレール部310bに沿って移動する。この場合、インクタンク400は前方部分が、突起404がガイド部材310上に支持されるので、インクタンク400の把持部412を操作者が持って押すだけで良く、スムーズな装着動作が可能となる。また、上述したように突起404はそのインクタンクの底面からの高さが適切に定められているので、インクタンクの突起404より下部の部分がホルダー300の底部に設けられたインク供給管330等と干渉せずに着脱を行うことができる。換言すれば、着脱時におけるホルダー要素との干渉を考慮してインクタンク形状をその干渉を避けるような形状とする必要はなく、これにより最大限のインク容量を確保しながら、着脱動作をスムーズに行うことが可能となる。

【0056】インクタンク400は最終的に位置Bを経て位置Cへと向かう。この際に、図4からも明らかな様に、インクタンク400の前端下部の突起405は、ホルダー300の抜け止め孔320に差し込まれて係合される。次いで、インクタンク400の後部を図中矢印D方向に押すことにより、ラッチレバー402がフランジ部302の縁辺のガイド部材312を越えて押し込まれ、そのラッチ爪403が係合孔321の縁部に係止される。これにより、インクタンク400のインク供給口401はホルダー300の供給管330に確実に当接される。なお、ホルダー300に対してインクタンク400を回動して装着する際、ラッチレバー402は、上述したように左右両側の側壁部406内部に変位するためラッチレバー自体がホルダーのフランジ等と干渉することがなく、円滑な着脱動作が可能となる。

【0057】以上のように、図4に示す装着位置Cにおいて、ホルダー300の供給管330とインクタンク400における供給口401に設けられたインク吸収体が接触して確実なインクの供給が行われる。また、この際、供給管330の回りに設けられた弾性部材304は上下方向に変形して、インクタンク400のインク供給口401の周囲とホルダー300の供給管330の周囲を良好にシールして万一インク漏れがあった場合でもこれを良好に防止することができる。

【0058】一方、インクタンク400をホルダー300から取外すには、ラッチレバー402を図4において

矢印E方向に押すことによってラッチ爪403がホルダー300の係合孔321の縁部から開放されて係合が解かれ、その後、インクタンク400の後部を持って引き出すことにより、インクタンク400の突起405が抜け止め孔320から引き出されると共に突起404が窪み部310cから引出されてガイド310に沿って装着時とは逆の順序で脱着が行われる。

【0059】なお、インクタンク400のホルダー300への装着および脱着はその動作のほとんどがインクタンクを斜めにした状態で行われるので、インクタンク400の上部スペースが最小で済み、インクジェット記録装置本体の上下方向の寸法を小さくすることもできる。

【0060】また、上述したインクタンク400の装着時にタンク400が受けるホルダー300からの反力は、弾性部材304の変形による反力F1、供給管330がインクタンク400内のインク保持体を押すことによる反力F2、およびラッチレバー402の変形による反力F3を合計したものである。特に、濃淡インク等多色インクが入ったインクタンクの場合には、そのインクの種類の数（ジョイント数）にほぼ比例するために、本実施形態のような6種類のインクを用いる場合は1種類のインクを用いる場合に比べてほぼ6倍の反力を受けることになる。このため、本実施形態では、シール部材として特に反力の大きくなる傾向にある弾性部材を用いる場合、通常のOリングのような従来の単純圧縮変形によるシールではなく弾性部材304のような煙突状またはラッパ形状を有する、たわみ変形および圧縮変形によるシール材または弾性部材とすることができ、これによって弾性部材304の反力を小さなものとすることができる。

【0061】さらに本実施形態では、図1からも明らかなようにインクタンク400における供給口の配置を、そのタンクの着脱時の方向を軸として略左右対称に配置したので、装着時における上述の反力を略左右対称とすることができ、これにより、装着時の安定した動作が可能となるとともに装着時においても均一な供給管と供給口部との圧接が可能となる。

【0062】さらに加えて、ジョイント位置、すなわちインク供給管330における接合位置を、支点となる抜け止め孔302とインクタンク400の後端部（操作者が押す位置）との距離の1/2以下、すなわち半分以下の位置とすることによって操作者がインクタンク装着時に押す力を小さくすることができる。

【0063】図5（A）および（B）は、本実施形態のインクタンクにおいてインクを保持するインク吸収体の圧縮について説明する図であり、同図（A）は同図

（B）におけるA-A断面およびB-B断面を示す断面図である。なお、本図は、Y、M、Cの1色のインクについてのみそのタンクの構造を示すものであり、また、淡インク部のインク供給口401の図示は省略されてい

る。

【0064】前述したように、濃淡各インクの収納室には、インク吸収体416が収納されておりこれらがそれぞれ濃インクおよび淡インクを保持している。これらのインク吸収体416は、図5(A)のB-B断面図に示すように、その最下部αにおいてこの吸収体を横断する方向に圧縮される。これは、各色インクの収納部間に前述の溝410が設けられていることによるものであり、これによってインク吸収体下部において不要なインクの滲み出しを防止することができるとともに、物流時に

【0065】また、インク供給口401には、前述のように、インク吸収体416とは別個の繊維状の吸収体415が設けられる。このため、その上部のインク吸収体416は、図5(A)のA-A断面図および同図(B)のクロスハッチ部に示すように、インク供給方向に圧縮される。これにより、この部分の毛管力を他の部分に対して相対的に大きくすることができ、その結果、このインク供給口上部へ周囲のインクを集め易くなり良好なインク供給が可能となる。

【0066】なお、各インク室には大気連通孔418が設けられている。

【0067】また、本実施形態の各部材に用いられる材料として、ホルダー300は、重量の大きなインクタンク400が装着された状態で落下した場合に耐え得るために衝撃強度の高い材料で作ることが好ましく、また、流路形成部材350は透明で、かつ、ホルダー300に溶着できる材料であることが、生産性の良いインクジェットヘッドを形成する上で好ましい。以上から、実施形態でホルダー300に変性ポリフェニレンオキシド(PPO)を用い、流路形成部材350に透明ポリスチレンを用いることができる。

【0068】図6は、上述したインクタンク400に対し、その流通過程等で用いられるキャップ(以下、物流キャップともいう)を取付けた状態を示す断面図である。また、図7は、上記物流キャップの概略斜視図である。図6において、1は物流キャップであり、400は上述したインクタンクである。

【0069】物流キャップ1は、本実施形態では、ポリプロピレン等の樹脂を成形したモールド成形よりなるものであるが、これのみに限定されなく、他の材質を使用してもよい。キャップ1には、成形時に同時に形成される複数の各突起9が設けられている。3は、キャップがインクタンク4002のインク供給口401をシールするための弾性体シール部材であり、キャップ1とエラストマーとを2色成形することにより形成され、キャップ本体に固定されている。この弾性体3の材質もエラストマーのみに限定されず、ゴムを用いることがで

き、またキャップ1本体への固定方法についても嵌め込み等とすることもできる。

【0070】インクタンク400は、前述したように、Y、M、Cの各インクに対応したインク収納室を有し、それぞれに対応するインクを保持したインク吸収体を収納している。

【0071】インクタンク400を流通過程等において扱う場合、落下時等におけるインク供給口401からのインク漏れやインク蒸発を防止するためのシール機能を持った物流キャップ1を衝撃やねじれ等により容易に外れることのないよう取付ける。

【0072】この物流キャップ1は、取手8のキャップロック部7をインクタンク400の両側面の各凹部422に嵌合させることにより固定される。この時、キャップ1の弾性体3がインクタンクのインク供給口401の周囲をシールすることにより、インクの漏れ、蒸発等を防止することができる。

【0073】なお、物流時等の落下、振動等の衝撃のため、インクタンク400内のインクが漏れて弾性体3まで流れ出ることがあり得る。この場合、漏れようとするインクのある程度は、インクタンク内のインク吸収体416によって引き戻されるが、漏れ出たインクの一部は弾性体3の上に多少残ることがある。弾性体3上に残るインク量は、弾性体3とインクタンクとの隙間を小さくすることにより少なくすることは可能であるが、皆無にはならない。この弾性体3上に付着したインクは、例えばユーザがインクタンクから物流キャップ1を取外す時に飛び散る場合があり、この場合、例えば弾性体3上に付着したシアンインクが飛散し、イエローインクのインク供給口401に付着すると、付着したシアンインクがイエローインク室内に引き込まれ、インクの色見が変化してしまうこともある。

【0074】そこで、本発明実施形態においては、それぞれのインクのインク供給口401をシールする弾性体3の間に、弾性体3高さよりも高い突起9を設け、弾性体3上に付着したインクが、異なった色のインク収容室に飛散しないようにしている。また、図7に示すように、弾性体3のシール部の長さbよりも、突起9の長さaの方が長くする。本実施形態においては、b寸法約15mmに対し、a寸法は約18mmとしている。さらに、図6に示したように、突起9とインクタンク400に設けた溝410とにより、迷路状の隙間が形成され、万が一物流中インク供給口401と弾性体3との間からインクが漏れ出した場合においても、漏れ出したインクは容易に異なる色インクの供給口401付近に到達しなくなる。これにより、さらに混色を防止することを確実なものとすることができる。本実施形態においては、突起9の溝410への挿入量は2mm程度であるが、溝410の幅が2~3mm程度と比較的狭いため、有効な迷路状の隙間を形成できる。

【0075】また、突起9は、キャップ1の平面内のねじれ変形に対して抵抗となりキャップを外れ難くすることができる。さらに、本実施形態のようにインクタンクが複数の色のインクを収納するものである場合には、キャップ1の幅が広くなるため、キャップ1をインクタンクから取外した後にインクの付着した弾性体3が触れ易くなるが、突起9が設けられていることによりユーザが誤って手等を汚すことを防止することもできる。

【0076】なお、上述したような複数色を収納するインクタンクの大きさが比較的小さく無駄な空間をできるだけ減らし、インク収納量を多くしたい場合には、キャップ1に設けられた突起9が、入り混む溝410の幅は可能な限り小さくすることが望ましい。しかしながら、一方において弾性体3上に付着したインクの飛散を防ぐためには、突起9の高さが高い方がよい。しかしながら、本実施形態において、このような構成、すなわち突起9の高さが高く、隙間10の幅が狭い構成を実施すると、突起9が溝410に挟まれてキャップ1の取外し動作が煩雑になる怖れがある。このような問題点を解決するためには、突起と溝の間隔を適切に設計することが望ましい。

【0077】また、突起9を弾性体3と同じ材質で形成し、キャップ1の取外し時において、突起9がインクタンクの溝に挟まれても、突起9自体が弾性体であることから取外しを容易にすることもできる。この場合、突起9と弾性体3とを連続した部材とし、ゲートを1つにすることにより、成形装置を簡単化することも可能となる。

【0078】図8および図9は本発明の他の実施形態に係るインクタンクおよびホルダーを示す図であり、図1

および図2と同様の図である。

【0079】本実施形態のインクタンクおよびホルダーは、例えばY、M、Cの3種類のインクに対応したものであり、この場合にも本発明を適用することができる。

【0080】図10は本発明の一実施形態に係るインクジェット記録装置を示す概略斜視図である。

【0081】本実施形態のインクジェット記録装置は、上述したY、M、Cについてインクタンクおよびホルダーと、ブラックインク(K)についてのインクタンクおよびホルダーを用いるものであり、それぞれのホルダー300はキャリッジ501において不図示の機構により着脱自在に装着される。キャリッジ501はガイドレール504と摺動可能に係合し、また、不図示のモータにより回転駆動される1対のプーリー503に張られたベルト502の一部と接続している。これにより、キャリッジ501はガイドレール504に沿った移動が可能となる。また、キャリッジ501の下方では被記録媒体としての記録紙506が不図示の紙送り機構により所定量づつ搬送され、この記録紙の搬送毎にキャリッジの移動によるインクジェットヘッドの走査が行われることによ

り、記録紙上に画像等の記録がなされて行く。

【0082】なお、キャリッジ501の移動範囲の一端には、吐出回復ユニット600が設けられ、例えばそのキャップ601により各インクジェットヘッドの吐出口が配設された面をカバーすることができる。

【0083】上述の各実施例では、インク容器に收容されるインクは、具体的にイエロー、マゼンタ、シアン等で説明を行ったが、これらに限定されるものではないことは言うまでもなく、さらに、收容される液体の種類として、インク染料分子を凝集させるような液体が含まれていてもよい。

【0084】

【発明の効果】以上の説明から明らかなように、本発明によれば、インクタンクの複数のインク供給口が配設された面において、そのインクタンクの着脱動作の方向に平行な方向に沿って溝が形成されるので、この溝によって隔てられるインク供給口が異なる色のインクを供給するものであるときはこの溝により、仮に一方の供給口からインクが漏れた場合でもそのインクが流れて他方のインク供給口に達することを防止できる。

【0085】この結果、インクタンクの着脱動作時等において万一インク供給口からインク漏れがあった場合でもインクの混色を適切に防止でき、常に良好な品位の記録を行うことが可能となる。

【図面の簡単な説明】

【図1】本発明の一実施形態に係るインクジェットヘッドが取付けられたホルダーとインクタンクを示す斜視図である。

【図2】図1に示すホルダーを一部破断して示す斜視図である。

【図3】インクタンクの側壁部の作用を説明する図である。

【図4】インクタンクの装着動作を段階的に示す図である。

【図5】(A)および(B)はインクタンクに収納されるインク吸収体の圧縮を説明するための断面図である。

【図6】インクタンクの流通過程等で用いられる物流キャップをインクタンクに装着した状態を示す断面図である。

【図7】上記物流キャップにおける各要素のサイズの関係を示す斜視図である。

【図8】本発明の他の実施形態に係るインクタンクおよびホルダーを示す図である。

【図9】図8に示すホルダーを一部破断して示す斜視図である。

【図10】本発明の一実施形態に係るインクジェット記録装置の概略構成を示す斜視図である。

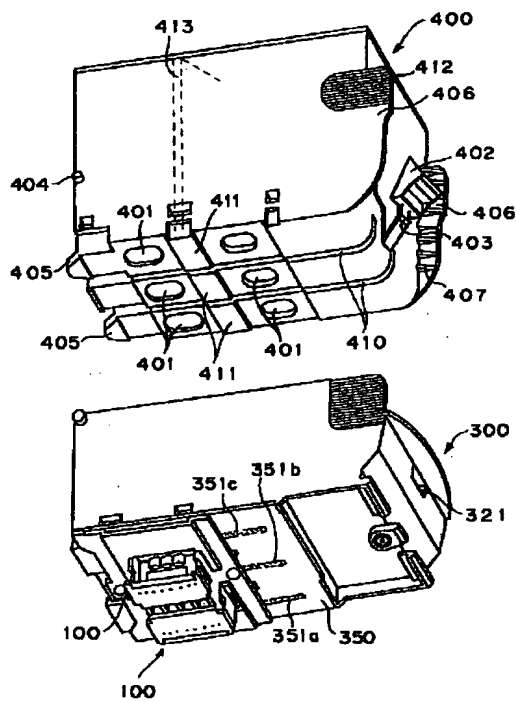
【符号の説明】

1 物流キャップ

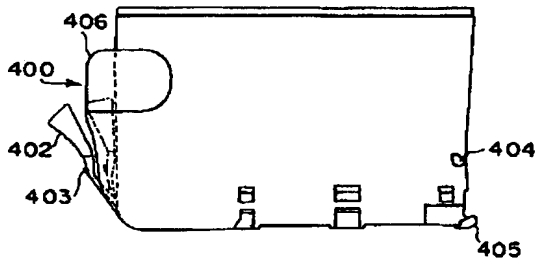
7 キャップロック部

- 8 取手
- 9 突起
- 100 インクジェットヘッド
- 300ホルダー
- 302 フランジ部
- 304 弾性部材
- 310 ガイド部
- 312 ガイド部
- 320 抜け止め孔
- 321 係合孔
- 330 供給管
- 335 リブ
- 340 屈曲部

【図1】

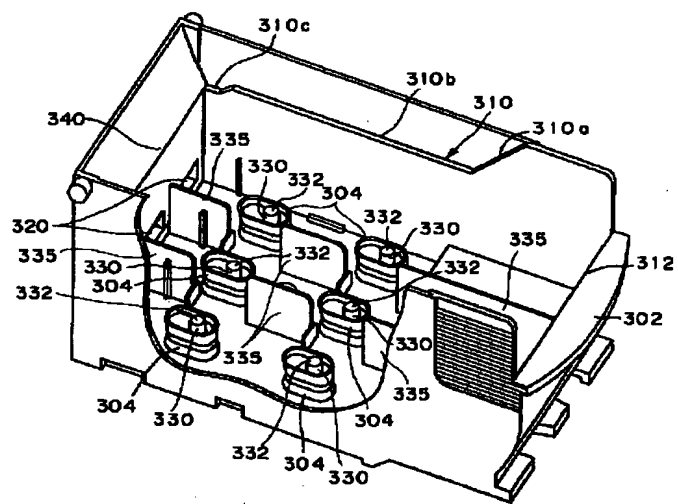


【図3】

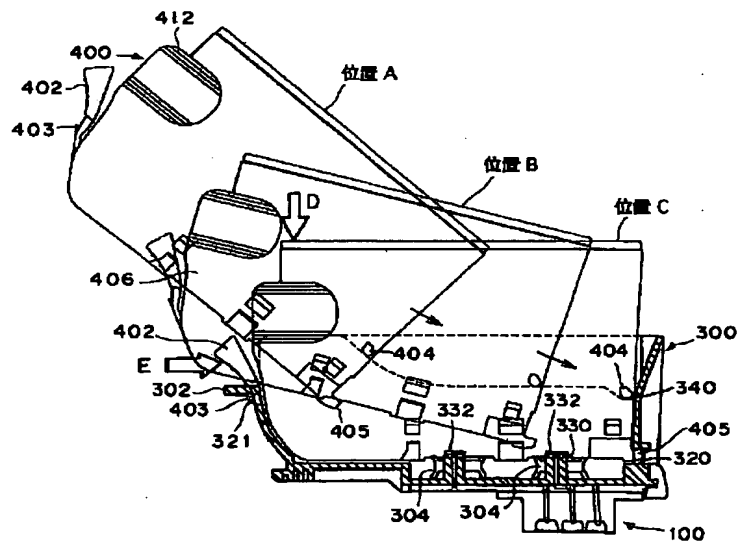


- 350 流路形成部材
- 400 インクタンク
- 401 インク供給口
- 402 ラッチレバー
- 403 ラッチ爪
- 404 突起
- 405 突起
- 410 溝
- 411 突部
- 412 把持部
- 415 インク吸収体
- 416 インク吸収体
- 501 キャリッジ

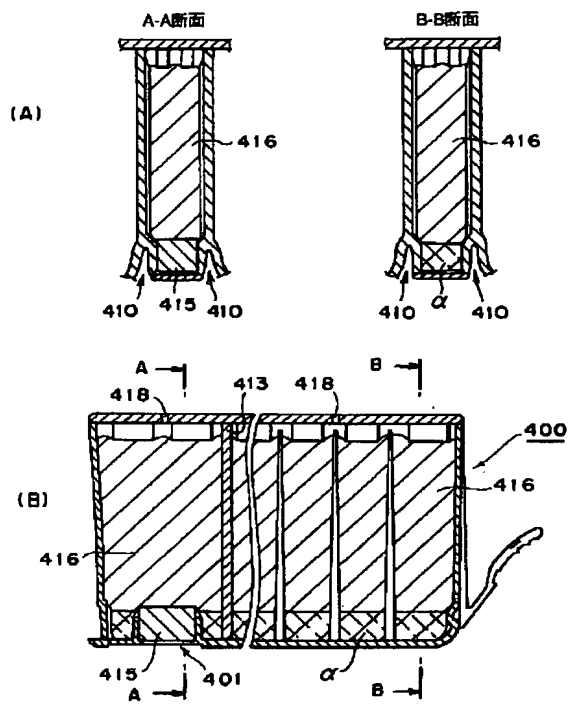
【図2】



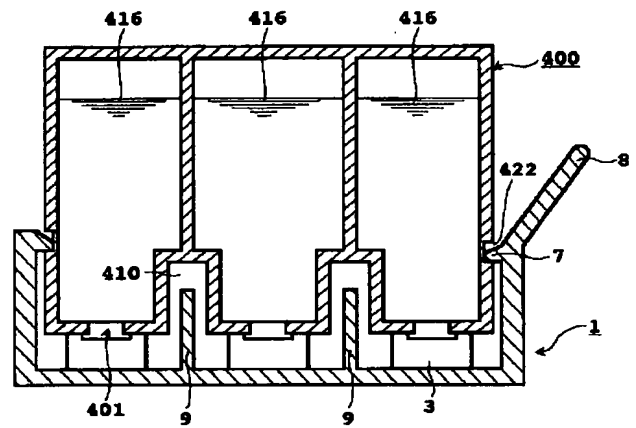
【図4】



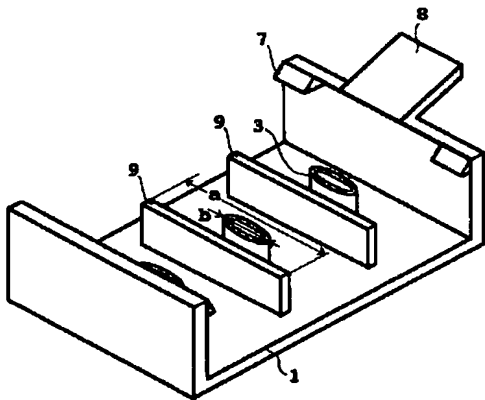
【図5】



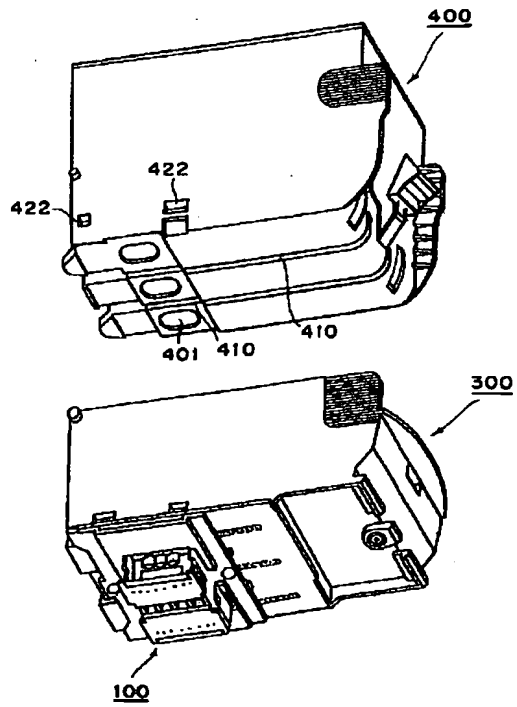
【図6】



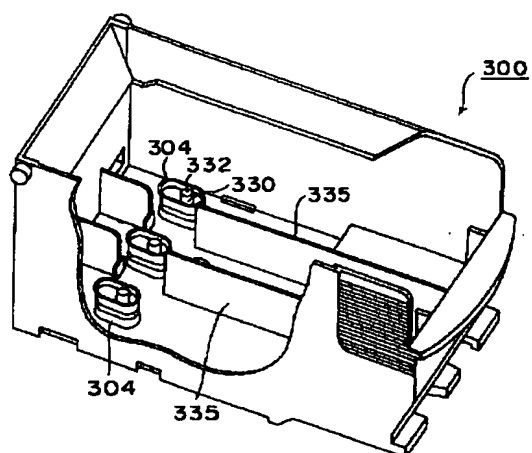
【図7】



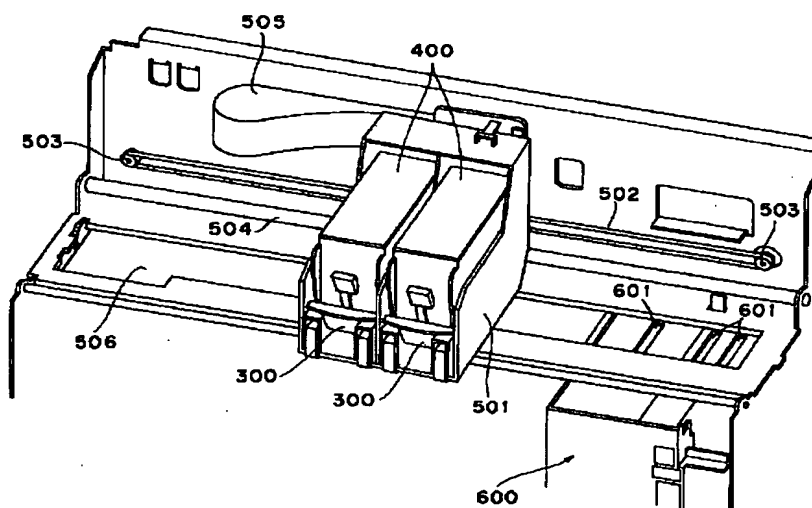
【図8】



【図9】



【図10】



フロントページの続き

(31)優先権主張番号 特願平9-30377
(32)優先日 平9(1997)2月14日
(33)優先権主張国 日本(JP)